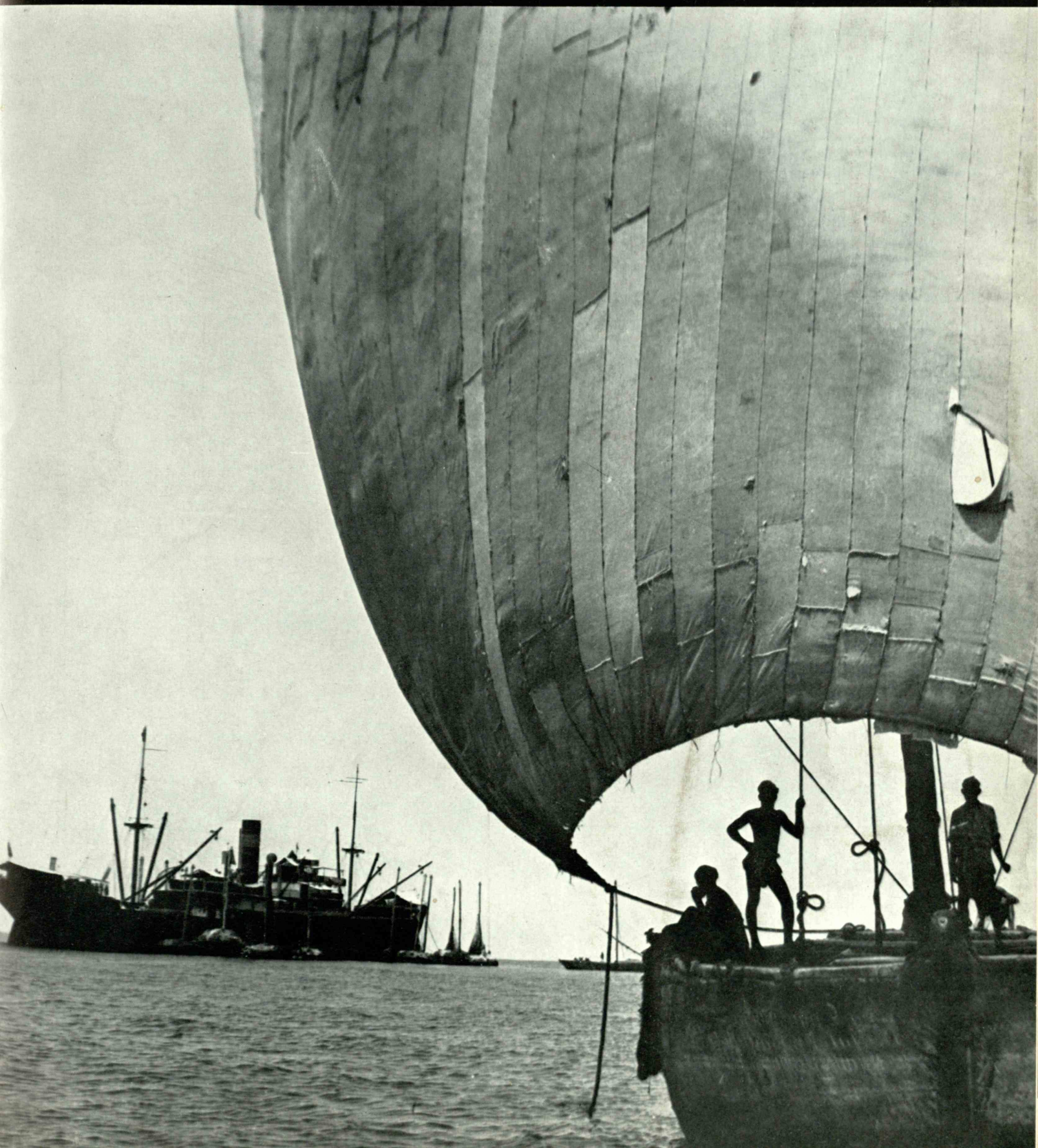


June 1940

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



# technology review

Published by MIT

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## GREETINGS

For NINETY-NINE YEARS the activities of the Badger organization have covered a wide range of processing projects that have taken their engineers to the four corners of the earth.

Badger engineers have been associated with the development of many processes of far reaching economical importance, the latest being the Houdry catalytic processes for the petroleum industry.

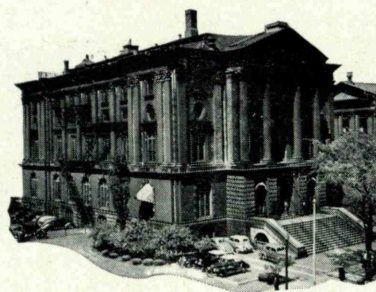
E. B. Badger & Sons Co. greets the returning graduates on M.I.T. Alumni Day, June 3, 1940.

### E. B. BADGER & SONS CO.

Boston, Mass.

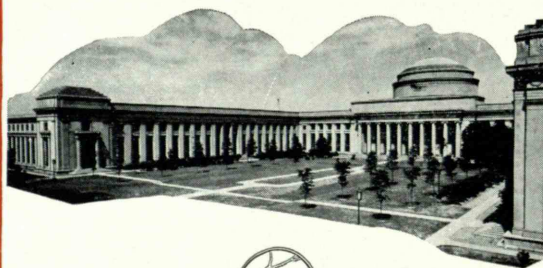
New York • Philadelphia • San Francisco • London • Paris

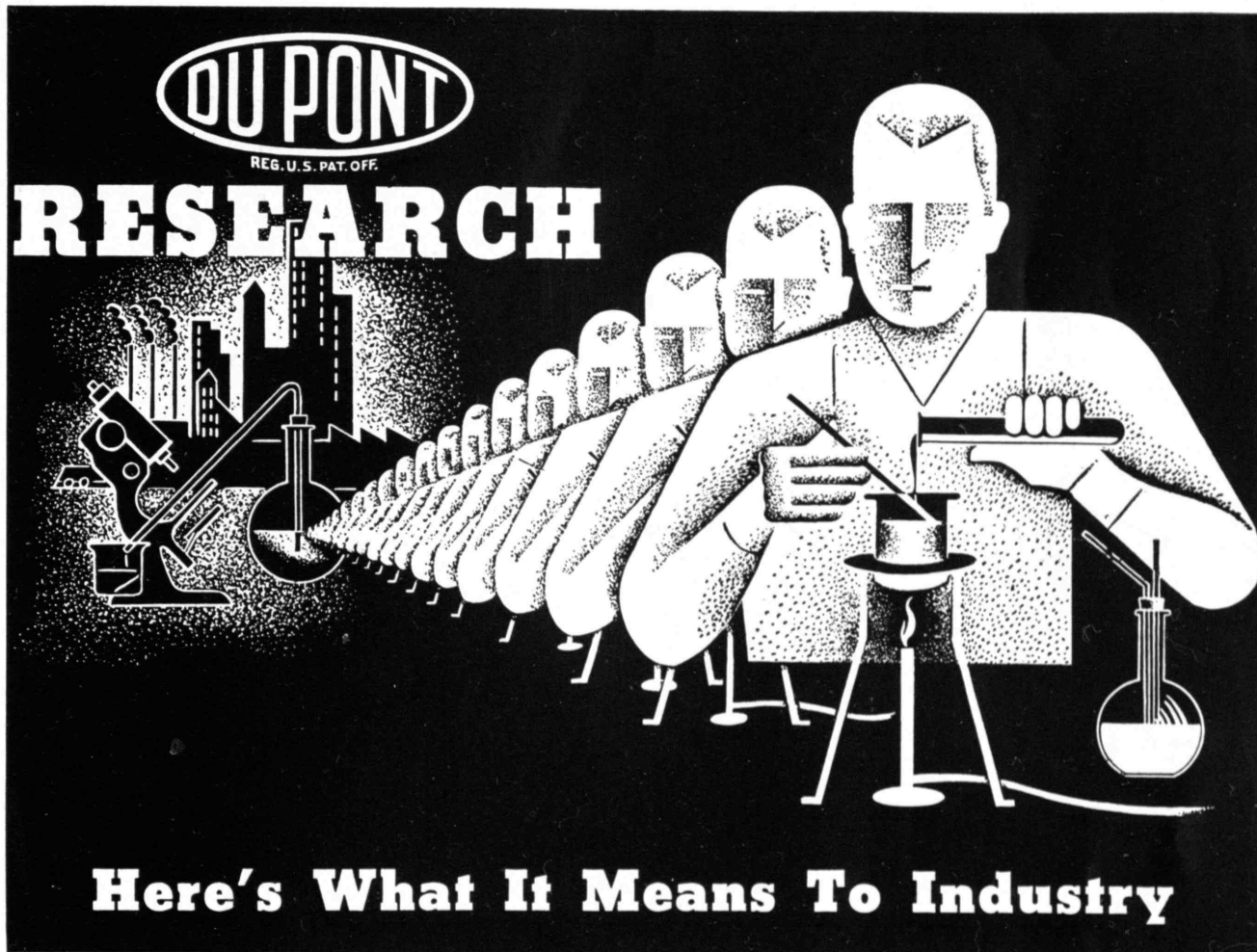
Chemical Engineers and Contractors  
Specializing in Distillation, Evaporation  
Extraction and Solvent Recovery



## *The Roster* OF TECH GRADUATES WITH E. B. BADGER & SONS CO.

C. R. Burleigh	1906
H. C. Merriam	1906
S. F. Hatch	1908
C. L. Campbell	1909
C. W. Gram	1909
G. P. Lunt	1910
A. V. Swift	1914
R. D. Waterman	1915
W. H. Blank	1916
J. R. Minevitch	1916
B. R. Rosenberg	1916
H. W. Hatch	1918
W. T. Hall	1919
H. C. Moberg	1919
H. G. Bower	1920
H. S. McGee	1922
R. W. Spry	1927
A. J. Connell	1928
J. S. Carey	1930
J. J. Brown	1933
B. D. Lucey	1933
V. P. Cook	1935
W. C. Rousseau	1935
M. W. Shellenbarger	1935
R. E. Sawyer	1936
G. A. Randall	1937
Margaret Hutchinson Rousseau	1937
T. B. Oakes	1938
J. M. Chambers	1939
J. C. Starr	1940





## Here's What It Means To Industry

**S**INCE its very beginning the du Pont Company has emphasized the importance of extensive, scientific research, both fundamental and applied. It has backed up its faith in research by maintaining large laboratories. In these laboratories groups of scientists are constantly working, in good times and bad, developing new lines of products, improving products in the old lines, checking up and modernizing old processes and providing new ones.

Every branch of industry, and the ultimate consumer, too, benefits by this extensive research. The objective is chemicals and materials which are cheaper, better, more easily worked to help manufacturers to reduce their costs, and improve their products. Better materials at lower costs enable manufacturers to develop and expand consumer markets, to make available

to more people more of the better things for better living.

Du Pont research is carried on for industry in general. New products and new uses can't be picked out of the air. New industries don't "just happen." They are the result of planned research, planned development far in advance, a careful groundwork of today to create the things which may be required to meet the needs and conditions of one, five, ten and even twenty years later.

The answer to what du Pont research means to industry rests with hundreds of improved products and processes which are now in use in a wide variety of industries, by the support which industry has given du Pont, thereby enabling it, not only to carry on, but to broaden its research activities.



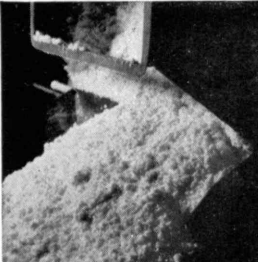
**E. I. DUPONT DE NEMOURS & COMPANY**  
**INCORPORATED**  
**Wilmington Delaware**

**BETTER THINGS *for* BETTER LIVING . . . THROUGH CHEMISTRY**

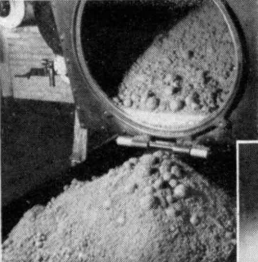


# RAYON... *from start to finish*

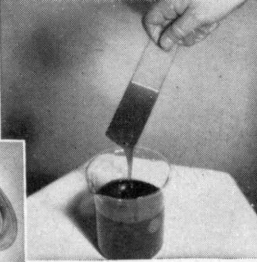
Cellulose plus caustic soda




Plus carbon disulphide




Dissolved becomes viscose



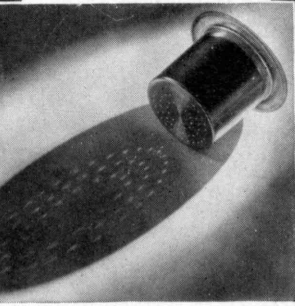
Yarn from spinning machine



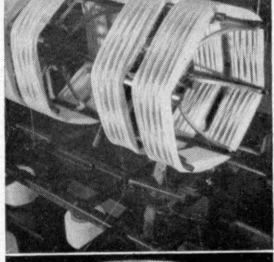
Pure cellulose

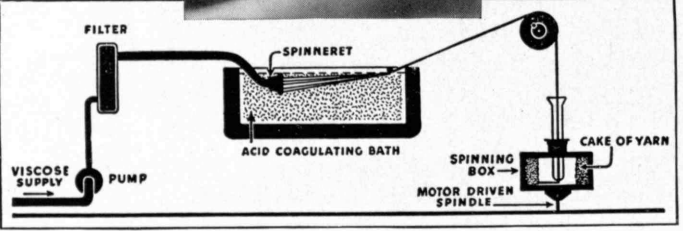


Spinneret



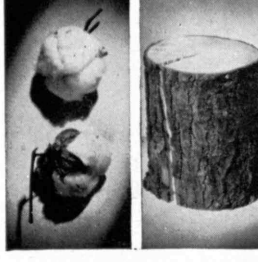
Skeins reeled prior to washing and bleaching



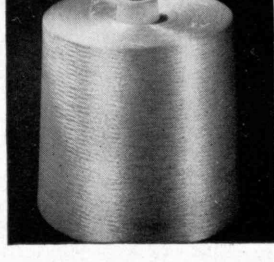


Spinning Operation

Cotton and Spruce



Ready for weaving or knitting



Viscose Rayon undergoes the following steps, from pulp to finished fibre:

1. Cellulose from specially treated wood pulp or cotton goes into a mill in "sheets" or baled loose pulp. These are...
2. Steeped in a mercerizing solution, broken up and...
3. "Crumbled." Then the "crumb" is aged in open pans and...
4. Treated chemically, to make it soluble. It then becomes a liquid, called viscose, and it is ready for the...

5. Spinneret. It is forced through minute perforations, forming fine filaments or threads, which harden in a coagulating bath; and many filaments are twisted into yarn by a revolving spindle.

Constantly tested for uniformity, at every stage, rayon yarn is shipped to fabric mills either in skeins or on cones or spools, ready to be placed directly on spindles or looms.

A man-made fibre, rayon has qualities which commend it—beauty, durability and adaptability to hundreds of textile uses.

For further information write:

**AMERICAN VISCOSE CORPORATION**

350 Fifth Avenue, New York City • *The World's Largest Producer of Rayon Yarn*

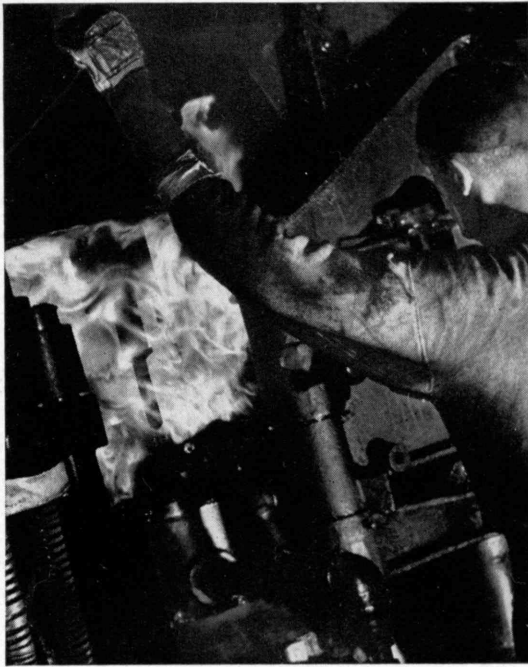
Copr. 1940, American Viscose Corp.



## PLANTS

Marcus Hook.....	Pa.
Lewistown.....	Pa.
Meadville.....	Pa.
Roanoke.....	Va.
Front Royal.....	Va.
Parkersburg.....	W. Va.
Nitro.....	W. Va.

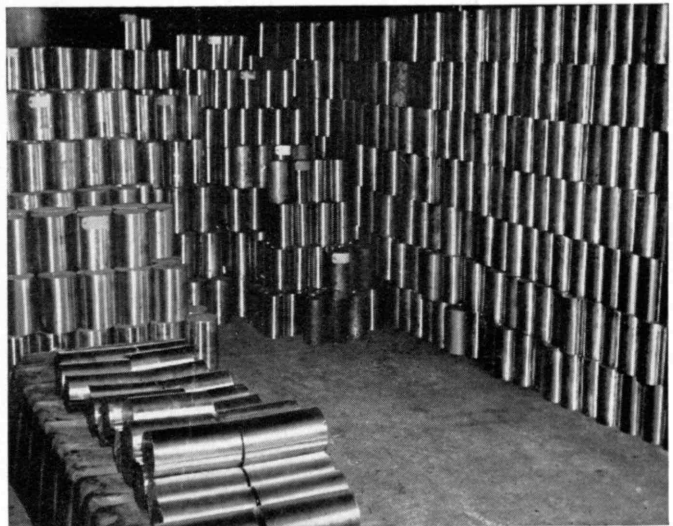
**THE FIRST NAME IN RAYON... THE FIRST IN TESTED QUALITY**



VERTICAL EXTRUSION OF NON-FERROUS BASE SIZES FOR CONDENSER TUBES AT WOLVERINE TUBE COMPANY

# CONDENSER TUBES . . .

**I**F YOU could only "wish" heat-exchanger tubes into your jobs just the way you want them — proper specifications conscientiously adhered to; best modern equipment for manufacturing; constant production control of physical properties; 100% inspection by men who are experts — if this were only possible, you would probably say to yourself, "There is the company for my tube business!" Let us hear from you.



CASTING PRACTISE AT WOLVERINE IS THE RESULT OF MANY YEARS OF EXPERIMENT AND PRODUCES THESE BILLETS FOR THE EXPRESS PURPOSE OF EXTRUDING NON-FERROUS TUBES

## WOLVERINE TUBE COMPANY

**DETROIT  
MICHIGAN**

**Seamless Copper and Brass Tubing**

GEORGE R. ANTHONY '98, Vice-President



# REUNION PROGRAM

May 31, June 1-4

Class Reunions: For scheduled reunions and meetings of classes during the reunion period, see page 332. Ask your Class Secretary for complete details.

## JUNE 2

6:30 P.M. President Compton's supper for Honorary Secretaries, officers of Technology clubs, and Alumni Fund class agents. Engineers Club, 2 Commonwealth Avenue, Boston. Informal dress.

## JUNE 3

### ALUMNI DAY AT TECHNOLOGY

#### Morning

8:30 A.M.-10:00 A.M. Registration for Alumni and their wives in the Rogers Lobby. Tickets previously ordered may be obtained at the registration desk. There will be a registration charge of \$1.50 for those not purchasing blanket tickets. Payment of this registration charge will permit Alumni to attend the Communications Conference and the Luncheon. *Tickets for these events cannot be purchased in advance of June 3 except by the purchase of a \$5.00 blanket ticket.*

10:00 A.M. Communications Conference, "Channels of World News and Opinion," Huntington Hall (Room 10-250). Admission by ticket only until 9:55 A.M.

#### Speakers

DR. FRANK B. JEWETT '03, *Presiding Officer*  
*President, Alumni Association*  
*President, Bell Telephone Laboratories*  
*Vice-President, American Telephone and Telegraph Co.*

ALFRED H. MORTON, *Vice-President in Charge of Television, National Broadcasting Company; European Manager, Radio Corporation of America 1929-1934; Manager Program Department, National Broadcasting Company 1934-1937; Vice-President in Charge of N.B.C. Managed and Operated Stations 1937-1939*

"THE ROLE OF RADIO IN WORLD AFFAIRS"

JAMES H. FURAY, *Vice-President, United Press Associations; Member of the Association of Foreign Press Correspondents; Staff of the United Press Associations since 1908; Foreign Editor 1918-1924; General Foreign Manager 1924-1937*

"BEHIND SCENES IN THE WORLD OF NEWS GATHERING"

#### Exhibit

This program, together with extensive exhibits in both the Main and Rogers Lobbies, showing scientific progress in the transmission of information by wire and radio, offers Alumni an unexcelled opportunity to inform themselves about the rapid development in the field of communications. Included among the exhibits will be a teletype receiving up-to-the-minute press association dispatches, teletypesetter for setting type by wire, picture transmitter, ship-to-shore radio transmitter and receiver with radio compass, aviation radio receiver and transmitter with altimeter, and others.

Alumni Day 1940 will long be remembered by Tech men for these interesting exhibits, and bids fair to become one of the most fascinating and stimulating alumni conferences ever held.

#### Afternoon

12:30 P.M. Luncheon for all Alumni and their guests in Du Pont Court. Tickets required. Special tables for the 50th (1890) and the 25th (1915) reunion classes, and for their women guests.

2:00 P.M. Class Day Exercises in Lowell Court, featuring the Senior Class, and the Classes of 1890 and 1915.

Prominent speakers, including representatives of the Alumni Association, 50th year, 25th year, and Senior classes. During the Class Day ceremonies, the present Senior Class of 1940 is officially initiated to membership in the Alumni Association.

4:15 P.M. Dedication ceremonies of Technology's swimming pool, made possible by alumni, staff, and student endeavor. After the dedication, the pool building will be open for inspection by Alumni and their guests.

#### Evening

6:30 P.M. Banquet in honor of the Tenth Anniversary of Dr. Compton's inauguration. No speeches except a brief highlighting by Dr. Frank B. Jewett of the accomplishments at Technology since Dr. Compton became its President, and Dr. Compton's interesting annual report on the status of the Institute.

A treat of the evening will be a demonstration in sound (not a moving picture), known as the "Vocoder." Its inventor, Dr. Homer Dudley, will be present to entertain, to amuse, and withal to excite the interest of the technically minded.

When a Hollywood director recently heard the "Vocoder" transform a pipe-organ rendition of "The Bells of St. Mary" into the words of this song, he described the effect as an ethereal choir. This mechanical Pygmalion of sound, the "Vocoder," could transform a Voice to a degree *cum laude*; it could even make the voice of Charlie Locke sound like Lily Pons!

Of course, there will be another attractive stein to add to your collection — obtainable only at the dinner.

Admission to seats at the banquet table will be restricted to former students, their male guests, and members of the Corporation and Staff who hold the \$5.00 blanket tickets. No separate tickets for the dinner will be available. Seating will be by classes, and seats will be reserved by number. We cannot guarantee to seat you with your class unless your ticket application is received on or before June 1. Informal dress.

Tables will be provided for nonalumni members of the Corporation and Institute Staff.

#### Program for the Ladies — June 3

An interesting and entertaining program has been arranged for Alumnae and wives of Technology Alumni. The program:

8:30-10:00 A.M. Registration in lobby of Rogers Building.

9:00-10:00 A.M. Coffee served in Emma Rogers Room (10-340).

10:00 A.M. Conference, "Channels of World News and Opinion."

12:30 P.M. Luncheon in Du Pont Court.

2:00 P.M. Class Day Exercises.

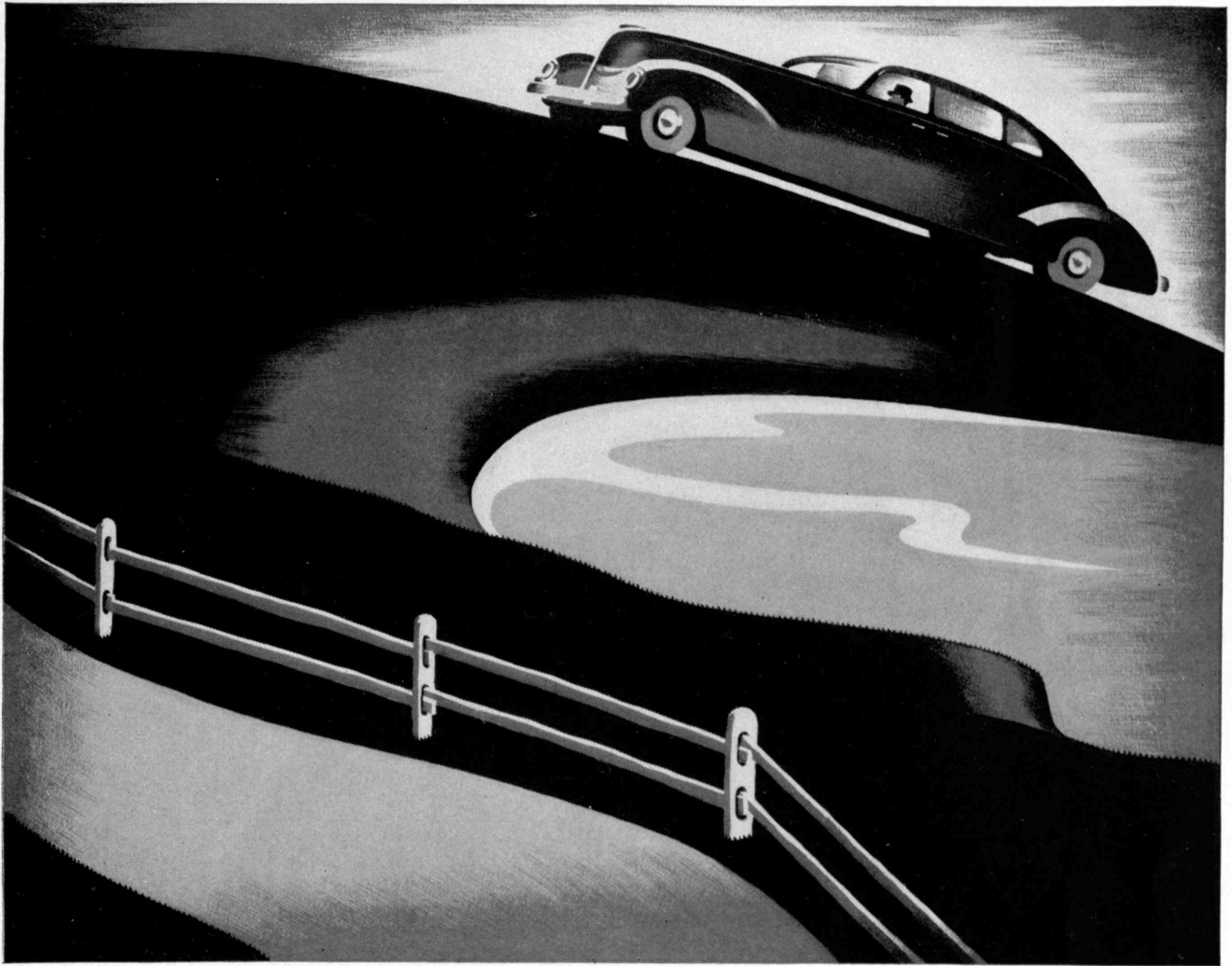
3:45-4:45 P.M. Open House in the Forris Jewett Moore Room (6-321), Eastman Building.

5:00 P.M. Motorboat Trip on Charles River Basin leaving from, and returning to, M.I.T. Sailing Pavilion in front of Walker Memorial.

6:30 P.M. Dinner at the home of Mrs. Karl T. Compton, 111 Charles River Road, Cambridge.

8:00 P.M. Busses leave the President's House for the Hotel Statler in time for program following men's dinner.

Tickets for ladies, covering Registration, Conference, Luncheon, Boat Trip, Ladies' Dinner at President's House, and the program following the men's dinner at the Statler, may be ordered with the men's blanket tickets at the nominal charge of \$3.00. Separate luncheon tickets may be purchased on June 3 at \$1.50; Ladies' Dinner tickets at \$2.00.



## REQUIREMENTS MET AND MONEY SAVED

Cast iron distributor gears for automotive engines have several recognized advantages. They are quiet, wear well, and are comparatively inexpensive. The problem is to produce a cast iron with the necessary wearing qualities and yet keep it machineable.

Several automotive engine manufacturers are now obtaining the necessary strength (50,000 p.s.i.) and hardness (250-300 B.H.N.) — and eliminating machining difficulties—by making distributor gears of Nickel-Chromium-Molybdenum iron. The machineability of

the iron is largely a result of its Molybdenum content.

By specifying this machineable iron, engine builders can meet distributor gear requirements with regard to noise and wearing quality — and save money doing it.

Full technical details concerning Nickel-Chromium-Molybdenum iron and other cast irons serving the automotive field with efficiency and economy are found in our book "Molybdenum in Cast Iron." Sent free on request to any interested technical student.

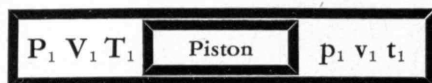
PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

**Climax Mo-lyb-den-um Company**  
**500 Fifth Avenue • New York City**



## *Just for Fun!* A CHALLENGE TO YOUR INGENUITY

THE ends of a closed cylinder, fitted with a leakproof, frictionless piston, are filled with perfect gases having the initial pressures, volumes, and temperatures indicated. If all of the walls are perfect heat insulators, where will the piston finally stop?



A says: Where  $P=p$ , using adiabatic processes.  
B says: The piston will oscillate perpetually.  
C says: Even though heat does not flow *through* the piston, the piston itself will act like a big molecule, and [after many oscillations] the pressures *and* temperatures will equalize.  
Who is right? Are there other possibilities?

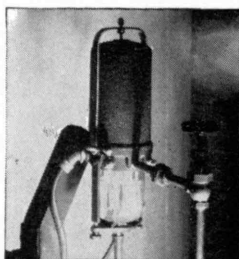
We specialize in industrial physics and offer a  
"GUARANTEED RESEARCH SERVICE"

**CALIBRON PRODUCTS, INC.**  
West Orange, New Jersey

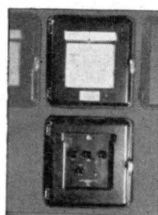
a continuous record of

**pH** values  
with a

**GLASS ELECTRODE**



The Cambridge pH Recorder offers many advantages. It operates from either 25 or 60 cycle lines, thus eliminates nuisance and limitations of batteries. The vapor-tight cases permit use under adverse conditions. Sampling point may be as much as several hundred feet from the recorder to which it is connected with only an electric cable. These and many other features make the Cambridge pH Recorder the ideal instrument for Power Stations, Oil Refineries, Water and Sewage Treating Plants, Textile Mills, Sugar Refineries, Paper Mills and other process industries.



Typical installation

Send for List No. 910 T

**CAMBRIDGE**  
THERMIONIC  
**pH RECORDER**



**CAMBRIDGE INSTRUMENT CO., INC.**  
3732 Grand Central Terminal, New York, N. Y.

## THE TABULAR VIEW

AS physicist and as president of the Institute, KARL T. COMPTON has a clear comprehension of science corresponding well with the sincere appreciation of religion which he possesses as an honest and reflective thinker. Hence discussion by him of these two concepts and their interrelations (page 319) is of particular interest and penetration. ¶ A. H. PHILLIPS, whose account of some of the ciphers utilized for the transmission of secret intelligence in wartime (page 321) is somberly appropriate to the present, was a divisional intelligence officer in the British army during the war of 1914-1918. He has spent many years in the United States as a newspaperman and as a scenario writer in Hollywood. His wartime activities gave him much insight into the ways and means of secret agents. ¶ Surgeon general of the United States Public Health Service since April, 1936, THOMAS PARRAN, JR., has done a great deal to bring sharply into the public consciousness both the service and the objectives which it seeks. In this issue, The Review presents an article (page 323) in which Dr. Parran discusses deficiencies in the national diet, their consequences in the national health, and the effects on industry and agriculture which are to be expected if effort to supply the lacks is successful. Dr. Parran's article is drawn from the William Thompson Sedgwick Memorial Lecture which he delivered at Technology in April of this year. ¶ As the summer opens and the camera enthusiast senses the gradual approach of vacation days, he may be thinking of emulating those photographers whose portrayals of birds and beasts have in the past stirred his envy. One of the ablest of these gentlemen is HENRY B. KANE, '24, first Director of the newly established Alumni Fund, author, illustrator, and portrayer of wild life whose photographs have been widely applauded throughout the country. In this month's Review (page 326) Mr. Kane tells all, or nearly all, of the tribulations and the delights of this kind of photography and, in addition, he tells many of the specific devices and means which he has found to be successful in its practice. The amateur who wishes to go and do likewise will here find shrewd advice. ¶ CLARK S. ROBINSON, '09, Associate Professor of Chemical Engineering at Technology, was presented to The Review audience in February, when he discussed, in the light of his experience as chief of the ammunition division of the Boston District Ordnance Office, American needs for wartime materials. A distinctly different subject engages him in this issue (page 329). His essay upon the factual history of metals which underlies North European mythology commands interest on its own merits and is, in addition, a side light on lands unhappily prominent in war headlines.

TO the Cover Club, The Review welcomes PAUL M. WISWALL, '09, with a striking photograph of a native lighter on the Malabar Coast of India. Lashings rather than treenails secure the hulls of these vessels, whose multipatched sails are colorful and curved.



# “SORRY, JONES, YOUR RUSH ORDER CAN'T BE FILLED”

*Business disasters like this  
can be prevented*

**WE BUILD FIRES SO YOU MAY  
KNOW HOW TO PUT THEM OUT**

**BOSTON MANUFACTURERS  
MUTUAL FIRE INSURANCE COMPANY**  
Marshall B. Dalton, '15, President

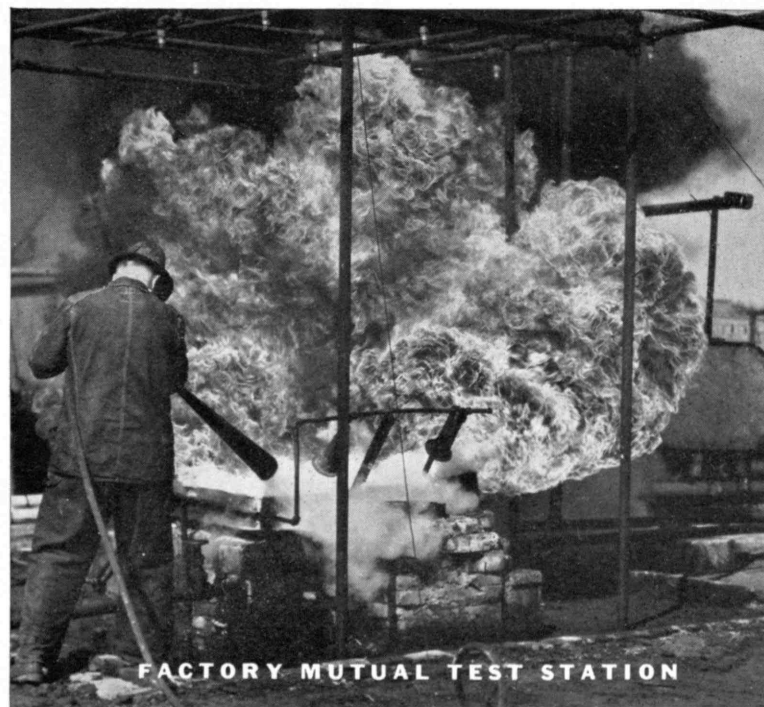
**WORCESTER MANUFACTURERS  
MUTUAL FIRE INSURANCE COMPANY**  
Waldo E. Buck, '76, President

**FALL RIVER MANUFACTURERS  
MUTUAL FIRE INSURANCE COMPANY**  
60 Batterymarch Street, Boston, Mass.

H. Leston Carter, '08  
C. G. Richmond, '11  
Howard F. Russell, '23

Robert L. Johnson, '38

Nelson D. Malone, '25  
Gilbert M. Roddy, '31  
William W. Garth, '36



**FACTORY MUTUAL TEST STATION**

**Members of ASSOCIATED FACTORY MUTUAL FIRE INSURANCE COMPANIES**



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# MAIL RETURNS

LETTERS AND PICTURES FROM REVIEW READERS

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## *Subdeb*

FROM L. MAGRUDER PASSANO:

Airy fairy, Neu-tri-no,  
Weighing nothing when you're slow,  
Gaining weight when moving fast,  
Tell us what you'll be at last.  
When you move with speed of light  
Will you be a "moving" sight  
Like Lillian Russell or Mae West,  
Broad of hip and full of breast?  
Or like the circus lady fat  
Whom as kids we wondered at,  
Needing a whole couch to sit on,  
With a shape no gown would fit on?  
All our girls, though fast enough,  
Still preserve that glamour stuff,  
And however fast their gait  
Never, never put on weight.  
Don't, dear, get Gay Ninety's figger.  
Have a heart and don't grow bigger.  
Put the brake on. Red lights show.  
Airy fairy, Neu-tri-no!

Brookline, Mass.

## *How to Do It?*

FROM THOMAS L. HINCKLEY, '06:

Few students of our government will quarrel with the three specifics for our governmental ills outlined by Stuart A. Rice in the April

Review. I wish, however, that Dr. Rice had carried his analysis one step farther and shown how these three objectives are to be reached. Beginnings along the lines indicated have, of course, been made in our manager-governed cities, in a number of counties, and in some states; the chief need would seem to be to determine how to accelerate this trend. The problem of how to speed up the process and at the same time be sure that we are not substituting new evils for those which already exist is of prime importance.

How, for instance, are our national political parties to be persuaded to yield control over the thousands of positions which form the very lifeblood of their respective organizations? How are the holders of such positions to become reconciled to giving up their means of livelihood in times like the present when the only alternative to a public job is apt to be a place on the public welfare pay roll? Who is to decide at each level of government which positions are necessary to the performance of essential public services and which are not — which units can be dispensed with and which cannot? And how can we be sure that in streamlining government we are not providing an ideal setup for some future demagogue . . . ?

Republican France owes her highly centralized and efficient governmental system mainly to the dictatorship of Napoleon; will it be necessary for us to pass through a similar experience in order to achieve what are conceded to be desirable ends — desirable at least from the standpoints of organization and administration? Is it not necessary to draw a sharp line of demarcation between the legislative aspects of government — where, in order to avoid the inclusion of sizable minorities, a large number of separate units are to be desired — and the executive functions, where streamlining is advisable? Again, bearing in mind that with each telescoping of adminis- (Concluded on page 309)

# STONE & WEBSTER ENGINEERING CORPORATION

DESIGN

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REPORTS

APPRAISALS

EXAMINATIONS

CONSULTING ENGINEERING

BOSTON • NEW YORK • CHICAGO

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# RESEARCH...

## Another Phase of NORTON SERVICE

LET THE distributor's representative who calls on you bring your grinding problems to the Norton Service organization. *See other side.*



NORTON ABRASIVES



# The NORTON RESEARCH LABORATORIES

Help You in Two Important Ways . .

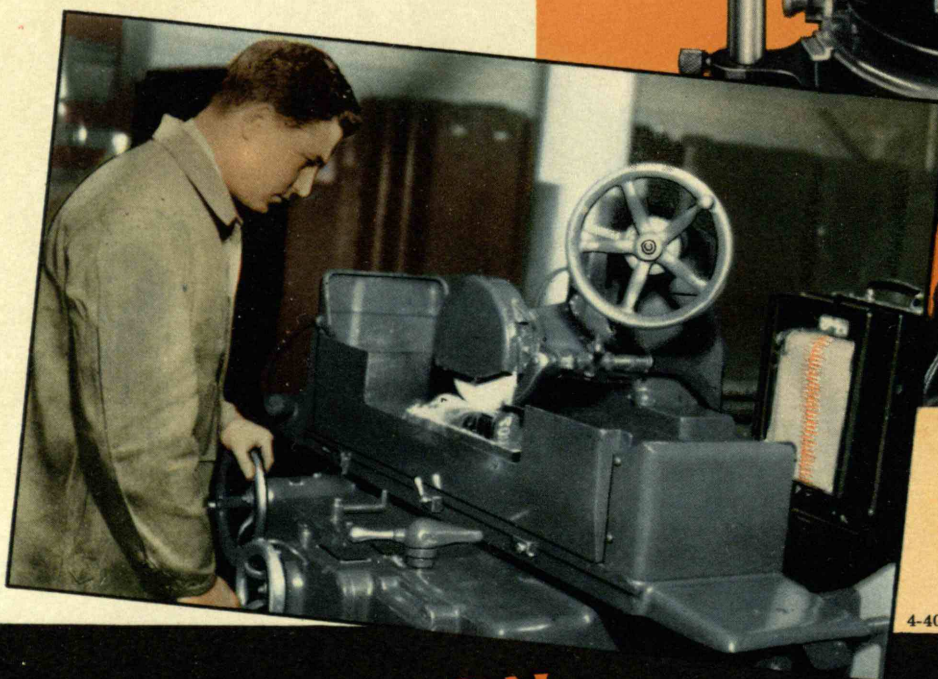
## *Product Improvement*

Many of the fifty trained scientists and technicians in the Norton Laboratories are thinking chiefly of the future — are busy developing new abrasives, new bonds and improved manufacturing processes that you may have better grinding wheels tomorrow. It is their vision and skill that gave the grinding industry B-E bond, controlled structure, diamond wheels, I-R Crystolon abrasive, Norbide (Norton Boron Carbide) and many other outstanding Norton developments.

## *Product Application*

Another part of the laboratory staff specializes on the immediate present — on solving customers' current grinding problems. Practical laboratory engineers cooperate with Norton distributors, representatives and field engineers to determine by actual tests, both in the laboratories and in the customer's plant, the correct wheels and grinding procedure.

You can depend on Norton Service to solve your grinding problems.



NORTON COMPANY  
WORCESTER, MASS.

New York	Chicago	Detroit
Philadelphia	Pittsburgh	Hartford
Cleveland	Hamilton, Ont.	

BEHR-MANNING DIVISION, TROY, N. Y.

4-40

# NORTON SERVICE



## MAIL RETURNS

(Concluded from page 308)

tration the power of some central authority is bound to be enhanced, how are we to maintain those principles of popular control which are the only safeguard against autocracy?

Another point upon which further information would be welcome is the amount of possible savings to taxpayers which would follow a better adjustment of the mechanics of government. Under an authoritarian system, large savings would unquestionably result from a reduction in units, a better adaptation of functions to areas, and the abolition of redundant functions; but under our present dispensation, where every governmental unit and every public job represent vested interests of some sort, how can we be assured that new units or new functions will not, as has so often been true in the past, simply be added to those now existing instead of replacing them?

It is tempting to assume that government is an entity, amenable to the disciplines which prevail in a single corporate organization, but such is far from the fact. Unless we get down to cases and deal with our governments as they are, we do not materially advance the cause of governmental reform. I feel sure that Dr. Rice has considered the practical application of his formulas to specific cases, and I wish that he would follow up his excellent article with an exposition of the means he would employ to insure intelligent action on his proposals.

Boston, Mass.

### Of Weights And Measures

FROM WALTER R. INGALLS, '86:

In the last number of *The Review* [page 269] there is a reference to our systems of weights and measures which is discerning of the reasons why highly organized industrial countries, like Great Britain and the United States, are unable to change to the metric system, whereas such a change in less advanced countries, e.g., Mexico, was not officially very difficult. Of course, it may be pointed out that decimalization is not a unique property of the metric system; there is an increasing tendency to decimalize English weights and measures.

I am writing to you, however, not in a spirit of discussion but rather as a seeker for information. You refer, among other things, to "long and short cords." I am unacquainted with any cord other than 8 by 4 by 4 feet, equal to 128 cubic feet. Will you inform me further? I am conscious of the fact that the height of horses is measured in hands, but I am unaware that the stone as a measure of weight is used anywhere in this country, although in Great Britain the weight of human beings is frequently measured in that way.

New York, N. Y.

[In some cities in the United States, stone is measured by the cord of 100 cubic feet.]

### Professor Ware's Advice

FROM LONSDALE GREEN, '87:

The interesting article on page 237 of the April Review, drawn from an early essay by Professor William R. Ware, brings to mind an interesting side light on his career. When I first conceived the idea of going to Technology, I looked around for advice from someone who had been there. Harvey Hannaford, '82, was the man, and I found him quite affable. What he said amounted to this: Before he went to Boston, he had assumed that the success of the architectural course at Technology was due to the fact that Professor Ware was at the head of it. But just before entering Technology, he heard that Ware was going to New York. So he wrote to Professor Ware and asked advice — whether to enter Columbia because Ware was to be there or to go to Boston.

Ware wrote by all means to go to Boston, saying that Letang and other good instructors were there and as far as Columbia was concerned he had yet to build up a staff which might or might not be as competent as the one at M.I.T. Furthermore, in Boston there was a good library, the atmosphere was conducive to scholars of ambition, and so on. Harvey found it so.

I spent only two years at the Institute as a special, but I had had a year in an architect's office. As soon as I returned to Cincinnati, Harvey found me out and took me into the office of Samuel Hannaford and Sons. They had plenty of good work, and soon I got a raise. That was the first time I realized that the reputation of having been to M.I.T. was an asset. . . .

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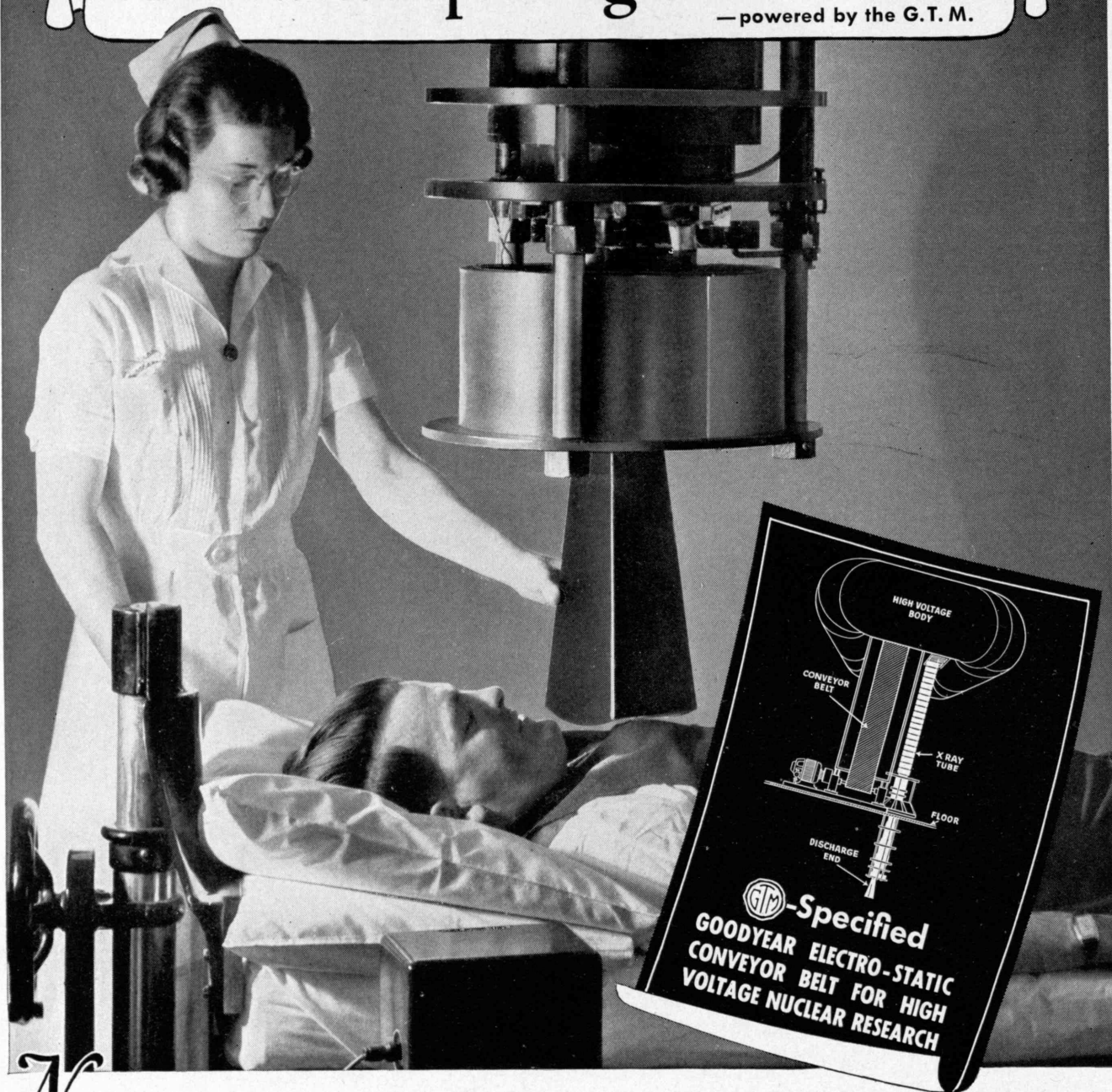
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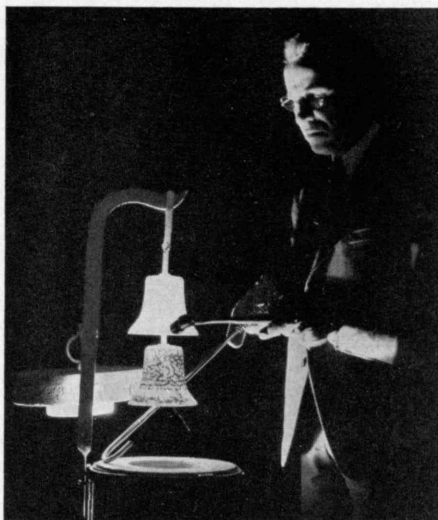
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# THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 42, NO. 8

CONTENTS

JUNE, 1940

## THE COVER

ON THE MALABAR COAST

From a photograph by Paul M. Wiswall, '09

LOT'S WIFE	FRONTISPIECE	312
RELIGION IN A SCIENTIFIC ERA	BY KARL T. COMPTON	319
<i>In Spiritual Values Religion and Not Science Has Its Role</i>		
CIPHER FOR SECRETS	BY A. H. PHILLIPS	321
<i>Modern Secret Agents May Well Employ Ancient Techniques</i>		
NUTRITION AND NATIONAL HEALTH	BY THOMAS PARRAN, JR.	323
<i>Dietary Deficiency Is Widespread and Serious</i>		
WILD-LIFE PORTRAITURE	BY HENRY B. KANE	326
<i>Tests Patience and Good Humor, Provides Much Pleasure</i>		
MYTH AND METAL	BY CLARK S. ROBINSON	329
<i>Migrations of Peoples Led to the Overwhelming of Bronze by Iron</i>		
THE TABULAR VIEW		306
<i>Contributors and Contributions</i>		
MAIL RETURNS		308
<i>Letters and Pictures from Review Readers</i>		
THE TREND OF AFFAIRS		313
<i>News of Science and Engineering</i>		
THE INSTITUTE GAZETTE		331
<i>Relating to the Massachusetts Institute of Technology</i>		

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Jane Kirby

*Lot's Wife*

# THE TECHNOLOGY REVIEW

Vol. 42, No. 8



June, 1940

## The Trend of Affairs

### *Uranium 235*

IN April of last year (page 243), discussing the first experimental and theoretical studies of the explosive division of heavy nuclei, The Review observed that "one can speculate at length on the possibilities suggested by the new discovery, but such speculations are premature as yet." We see no reason to change our opinion at present, notwithstanding recent newspaper declarations of swifter impending revelations.

The only new development is that Alfred O. C. Nier of Minnesota University has managed to separate out enough uranium 235 for John R. Dunning and others at Columbia University to confirm that this isotope of uranium is broken up by slow neutrons, whereas uranium's other isotopes are sensitive only to fast neutrons. Neils Bohr, John A. Wheeler, and others stated last year that this should be true. Last winter several workers computed the amount and concentration of uranium 235 necessary to start a self-continuing reaction when surrounded by water — the water slowing down the neutrons produced by the nuclear explosions so that they can trigger off other explosions. The requisite amounts and concentrations are still not attainable and may not be attainable for many years. This work of Nier and the others brings us a step closer to the practical utilization of nuclear energy, but the step is no greater in size than hundreds of other steps which have been made toward the same goal in the past ten years.

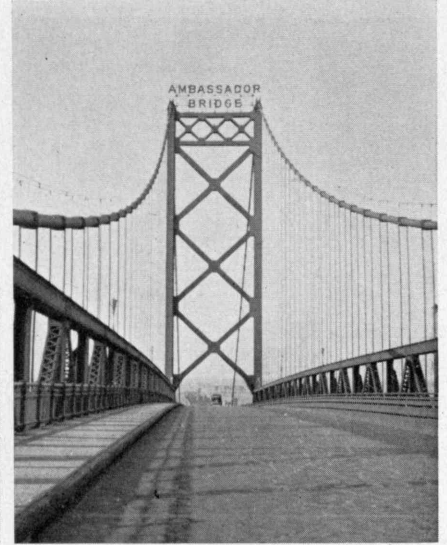
The average scientist viewed the late journalistic furor with amused surprise. In his opinion the time for such articles was last year, when the uranium reaction was first discovered, or else in the future, when enough uranium 235 will have been collected to make the reaction self-sustaining. To us, however, the affair seemed to

be a good example of the danger of considering science as spot news. Scientific developments are rapid enough nowadays, but they do not come with the dramatic suddenness characteristic of some other public affairs. An attempt to report science by using the techniques suitable for reporting wars and murders is almost certain to lead to misconceptions. The essential aspect of science is its gradual and co-operative development; and to cry out at some place in its progress that here is *the* big step, this man *the* discoverer, is to falsify the picture and to ignore unfairly the other co-operators.

Most scientific workers dislike this falsification and are, in consequence, cautious when they talk to newsmen. As a result, the reporters complain that the scientists do not co-operate with them and have no imagination. This is, of course, untrue; as a matter of fact, the speculative fancies bandied about among scientific workers when they are by themselves would adequately supply material for several science-wonder magazines. It is only in talking to the reporter that the research worker restrains his fancy; he knows the misunderstandings which can arise when one speculation from hundreds is singled out for the headlines. Perhaps if the reporter wrote a continuing column in which most of the steps in the progress of science could be recorded and in which as many as one out of a dozen of the prevalent speculations could be mentioned, the scientist would not be so cautious. But when one story a field a year makes the headlines, he prefers that story to be factual and sober.

This is, naturally, unfortunate, for scientific news can be just as interesting as murder news, as exciting as political news, and sometimes as important as war news. But it needs its own type of reporting and it needs specialized reporters to cover it — just as do the other fields. There are a few such reporters in this country. More of them would be welcome.





Photos by W. W. Lewis, '89

Toward greater span, more graceful tower, the development of the suspension bridge in America is representatively catalogued in these pictures and those on the next page. Here are, left, the Brooklyn Bridge, constructed between 1870 and 1883, with a main span of 1,595 feet; center, the Camden Bridge at Philadelphia, 1921 to 1926, main span, 1,750 feet; right, the Ambassador Bridge at Detroit, 1927 to 1929, main span, 1,850 feet.

### Earthquake Analyzer

SHORTLY before the disastrous Long Beach, Calif., earthquake of March, 1933, the United States Coast and Geodetic Survey installed a number of strong-motion earthquake recorders in the West Coast region. The purpose was to furnish engineers with much-needed reliable data on the nature and intensity of earthquake motions by means of records taken directly in the zone of serious damage, a mission which cannot be fulfilled by the very delicate seismographs used for day-by-day recording of remote earthquakes.

The strong-motion recorder lies dormant until a near-by shock of predetermined intensity trips the trigger mechanism which puts the instrument into action. When the service crew next visit the recorder, a complete picture of the shock is there waiting for them. Some fifty such instruments are maintained by the Coast Survey, and, beginning with the Long Beach quake, many records of large, medium, and small shocks have been obtained already. Fortunately, most of the quakes since 1933—save those at Helena, Mont.—have been minor. All local shocks have meaning and value to the engineering seismologist; the destructive ones are naturally most important, but even the small shocks are of great value since they occur relatively frequently and yield information that no man-made shaking can give.

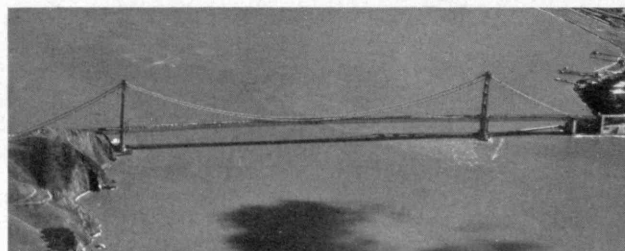
To study and compare the extremely complex records of local earthquakes, something far better than visual examination is needed. The engineering seismologist, faced with a growing library of valuable records of destructive and nearly destructive shocks,

finds himself at a loss to express their true meaning in a quantitative manner—their power to destroy the works of man.

Arthur C. Ruge, '33, Assistant Professor of Engineering Seismology in the Institute's Department of Civil and Sanitary Engineering, has developed an earthquake analyzer which fills this need in a very practical way by making it possible to plot what might be described as a "destructivity spectrum" of the earthquake in question. The record, in the form of a shadowgraph on a film, is scanned by a light beam falling on a photocell which converts the earthquake record into electrical impulses, just as the sound track on a film is turned into sound. This electrical earthquake is amplified and fed into a galvanometer, the swinging of which represents, to a known scale, the swaying of a building of like vibration period as a result of the actual earthquake. The swinging of the galvanometer is recorded on sensitized paper by means of a light spot reflected from the galvanometer mirror; the maximum swing recorded provides a quantitative measure of the destructivity of the quake to buildings of that particular period of vibration and so gives one point on the destructivity-spectrum curve. Technically, the process would be called wave analysis of a very special type. By means of another photocell and amplifier system, the period and damping of the galvanometer (i.e., the building) can be altered at will

within wide limits by simply turning the control dials. In this way the investigator obtains as many points on the spectrum curve as are required for complete definition.

It is expected that the new analyzer will make possible definitive research into the now debated questions of the effects of local



© Gabriel Moulin

The Golden Gate Bridge, built between 1933 and 1937, with a main span of 4,200 feet and two others of 1,125 feet



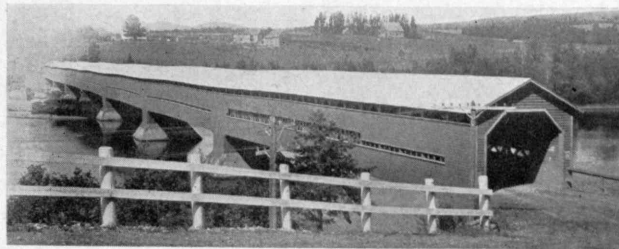
geological conditions and of large buildings themselves upon the nature and destructivity of earthquake motions, as well as provide a means of classifying and comparing earthquakes quantitatively. In addition, the device offers interesting possibilities in the analysis of other complex functions, such as rainfall data and sunspot activity, since it is able to "spot" the frequencies present regardless of their relative magnitudes; ordinary Fourier analysis can be performed as well. With slight modifications the same machine can be made to solve some extremely difficult and important vibration problems of the mechanical engineer.

This work is done in close collaboration with the United States Coast and Geodetic Survey, as is all of the Institute's research in engineering seismology. The Institute also maintains a seismograph station in East Machias, Maine, interpretation of its records being made by the survey, as part of a strong chain of co-operating stations.

### *Hammurabi and the Hapless Houser*

LIKE most other forms of law, the building code has an ancient history. Hammurabi's famous tablets contained many incisions relating to the building industry, of which perhaps the most famous reads: "If a builder has built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be slain."

Such a law is simple and clear and far easier to understand than a modern building code. In effect, save for the eye-for-an-eye provision, it offers a pattern for some contemporary code reformers who would place everything on a performance basis and make the architect,



W. W. Lewis, '89

*And just by way of contrast: a covered bridge over the Cascapedia River, Gaspé Peninsula, Quebec*

engineer, and builder vitally responsible for failures. This is a good idea, yet it may seem out of harmony with a current legal philosophy which apparently believes that every man is a scoundrel until proved otherwise.

Our own building codes started out as protection against fire; they were

later extended to safeguard minimum health requirements; and still later, to safeguard minimum housing requirements. But while all this was going on, the codes were also warped to safeguard other less desirable things and even developed into legally established boycotts, particularly relating to walls, roofs, electrical work, and plumbing. This venomous trend, together with the wide dissimilarity among the codes of essentially similar areas, has led to strong pressure for reform. Such pressure is not new but, at the moment, it seems stronger than before, and the forces at work seem more harmonious and more likely to attain their objectives.

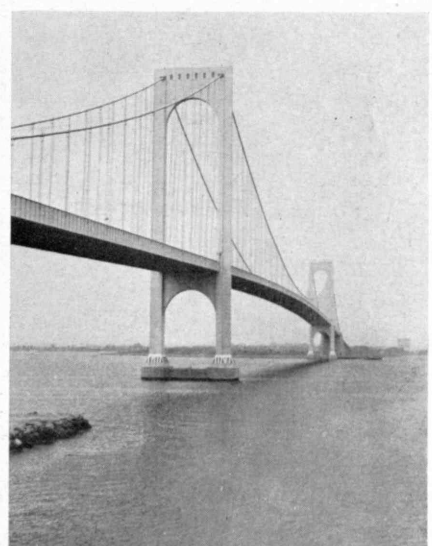
The inconsistencies are less important than the warping of the purpose of the code. Nonetheless, some of the nonuniformity is ludicrous. Differences of as much as 400 per cent may occur among the cities of New York, Boston, Atlanta, Chicago, and Detroit in allowances for such easily measured things as the cross-grain strength of fir, the strength of specific concrete mortars, the permissible load on identical piles, the required thickness of masonry walls, the amount of concrete required for fireproofing steel or for such readily calculable items as the moment factors for continuous concrete beams in identical circumstances. Plumbing used in the new Department of Justice Building is not, by the codes of many cities, considered good enough for use in houses.



W. W. Lewis, '89



© Gabriel Moulin



W. W. Lewis, '89

*These representative suspension bridges are the George Washington at New York, constructed between 1927 and 1932, with a main span of 3,500 feet; the San Francisco-Oakland Bay Bridge, opened to traffic in 1936, with two main spans of 2,310 feet; and the Whitestone Bridge at New York, 1937 to 1939, main span, 2,300 feet.*

In Denver recently, a school was designed for reinforced-concrete frame construction, and use of curtain walls (nonload-bearing panels) of glazed tile blocks inside, crosstied to terrazzo-faced slabs outside, was proposed. Since the Denver code permits only eight-inch solid masonry for curtain walls, *if masonry be used*, the proposal could not be followed. But quarter-inch plate glass or four-inch glass blocks could have been used in the same curtain-wall areas without code violation.

These silly discrepancies are without malice and have crept in from time to time. By and large, since malice is absent, they can be corrected by constant watchfulness and steady revision. When purpose to protect privilege is behind the law, the situation is different. Such privilege does not quickly relinquish its preferred position. One of the largest manufacturers of plumbing equipment cannot have its wares installed in Chicago. California's law requires 50 square feet free of cabinets in a kitchen; this area is too large for small apartments and effectively prevents the use of strip, or cupboard, kitchens in such apartments. One of the largest prefabricators, utilizing a construction the engineering principles of which were originally developed in the United States Forest Products Laboratory, has had constantly to wage suits against building inspectors who have tried to interpret code provisions too rigidly — often, one suspects, spurred on by local interest which felt itself endangered by the outsider. Typical cases have occurred in Ohio and in Maryland. One of the items of the new Chicago code requires that all interior walls be lined with a fireproof monolithic material. Since the cheapest material is plaster, this prescription is in effect a legal subsidy to the plasterers. This count could be multiplied indefinitely.

There is a more general form of interest which might be said to apply to all existing building craftsmen and, even, to the manufacturers of some conventional building materials. Though these people may, at any

given point, be entirely innocent of trying to create a special privilege in the code, they have a joint interest in preventing new methods from reaching the market. Big industry itself has felt the pressure of this sort of thing, which expressed itself merely in a wish to maintain the code in the status quo. Drastically new types of construction have scant opportunity for use except in rural districts or in new towns.

The attack against these practices will take the form of revision of codes on the one hand and of prosecution for restraint of trade on the other. If the various political and sociological auspices are favorable, a substantial basket of chips may be harvested.

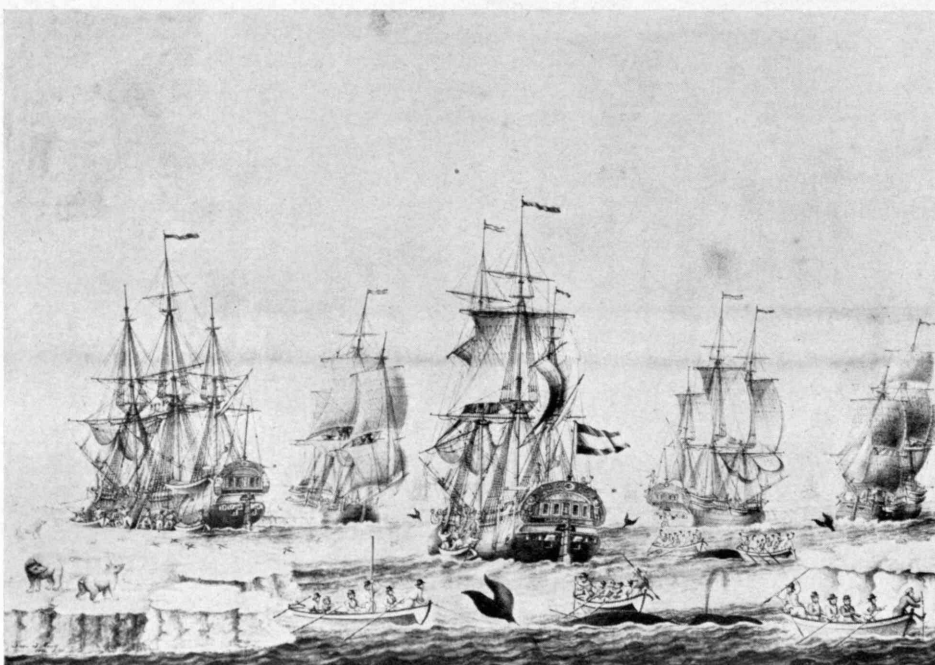
### Mobbing Moby Dick

WHEN men concentrate on killing each other, the rest of animal creation may expect a new lease on life. Mink in New England streams, for example, are judged to stand less chance of stepping on the pan of a hidden trap as long as the London fur market is upset by war. And at the other extreme among animals hunted for profit, the whale may be given a much needed surcease from the lethal attentions of mankind. German pelagic whaling is in abeyance as a consequence of war, and events in Norway may conceivably have done much to interrupt the operations of the fleets of that greatest of whaling nations. Demand for the products of the whale fisheries, stimulated by the insistence of war, may be frustrated by the same insistence.

If it is so frustrated, mankind should profit in the long run — for leading Norwegian operators are reported convinced that the whaling fishery is certain to become economically unexploitable within the next five years. Whales breed slowly, with but one birth — usually a single birth — in two years; men kill whales more swiftly than ever, so that in spite of international restriction of the catch — including game laws specifying minimum legal size — the number of whales being killed is four times what the oceans can provide over a long period of years.

Between 1920 and 1940, Robert Cushman Murphy of the American Museum of Natural History reports in *Science*, about half as many whales were killed as during the whole preceding

*Whaling as it used to be: an unusually fine old water color of a Dutch whaling fleet in the Arctic, one of many rare prints in the Henry P. Kendall whaling collection now on exhibition in the Nautical Museum at the M.I.T. Intent upon atmospheric details, the artist made the three polar bears at the left interested spectators of the whaling chase. Note the crews of the two whaleboats at the right standing with caps lifted high in the cheer of victory as a whale is captured.*



Doon T. Moou



history of whaling. For the three centuries ending in 1920, about 3,000 whales were killed yearly; the average annual kill since then has been over 25,000. More than a half million were killed in the seas of the world between 1919 and 1938.

Invention of the Foyen gun in the middle 1860's, the entry of steam catching ships into the Atlantic section of the Antarctic in 1904, the development of the factory ship, which processes the whale carcass in the open ocean and which — served by as many as ten catchers — can handle a dozen whales a day, have combined with demand for food, for food fat and soap material, and for industrial oil thus to decimate the world's greatest animals.

### Trail into Turnpike

SNAKE and bat and skunk polecat in parts of the Pennsylvanian mountains during the past year and a half have been undergoing progressive eviction from snug domiciles built for them by men and occupied for over half a century. Started sixty years ago, the route of the South Pennsylvania Railroad between Harrisburg and Pittsburgh drove, through mountain ridges, tunnels that became dark menageries when the project was abandoned after consuming ten million dollars, and the roadbed was left for the forest to reclaim.

Demands imposed by the automobile and the truck led Pennsylvania, in 1937, to constitute the Pennsylvania Turnpike Commission, which, purchasing seven tunnels and 124 miles of roadbed, has raced against time in turning the old trail into a turnpike of great economic and military importance, linking as it does the steel center and the eastern seaboard.

Utilization of the old tunnels, most of which were only about half finished, and construction of 114 bridges and several viaducts make the total amount of climb on the turnpike less than 4,000 feet, as compared with some 13,000 feet on other highways linking the two cities. The tunnels are being bored to greater width and height to accommodate the roadway, which is graded 78 feet wide in the open, narrowing to 28 feet at the tunnel entrances. Two 11½-foot lanes will carry cars within the tunnels, the longest of which burrows 6,650 feet through Sideling Hill.

Federal grants totaling between sixty and seventy millions financed the project. Under the terms of the grants, the highway must be "substantially completed"



*Mechanical ants, tractors busy pioneering a cut and fill down a natural slope of 5:4 during grading operations for a highway cutoff in California*

*California Department of Public Works*

by the twenty-ninth of this month — hence the race against time, the engaging of 127 contractors and subcontractors, the marshaling of a peak pay roll of 15,000 men plus 1,500 employees of the Turnpike Commission, and the assembling of a spectacular array of the most modern excavating, grading, and road-building equipment. Construction of the turnpike is rated as involving the biggest earth-moving job yet undertaken in road building — the excavation of 26,000,000 cubic yards of earth and rock — the use of 392,000 tons of cement, 50,000 tons of steel, 700,000 tons of sand, and over a million tons of crushed stone. At the end, cars will hum calmly through steel-buttressed, concrete- and glass-lined mountain bores which in their older days were gloomy caverns surrendered to animals.

### Skim Milk

ALTHOUGH consumers usually judge the quality of milk by the cream content, many of its very valuable constituents are submerged below the cream line. Because cream always rises to the top, contains fat and vitamin A, and is the source of butter and ice cream, the public has given it a position of importance to which it is not entitled. Whatever may be said about the unattractive appearance of skim milk, it contains the major portion of the protein, calcium, phosphorus, sulphur, and iron content of whole milk, as well as the valuable vitamins B, C, and G.



But skim milk is an outcast, and fifty billion pounds of it are used annually as food for animals and in the manufacture of paints, synthetic resins, textiles, and other commercial products or are simply dumped as waste. Even that portion used for animal food is not efficiently reclaimed, for only about 10 per cent of the food value of skim milk fed to pigs shows up in the pork product.

Thus, in the face of widespread malnutrition, a valuable and inexpensive food is, to a large degree, being wasted. Partially responsible for this condition are the public's natural disdain for skim milk and the widespread ignorance concerning this product's great nutritive qualities. Part of the responsibility rests on certain legislation, originally designed to protect the dairyman, which forbids many combinations of skim milk with other ingredients to make inexpensive but often healthful foods.

Any new foods which can legally help bring skim milk back into the food category are worthy of attention. One such has recently been developed by B. H. Webb of the Dairy Research Laboratories in the United States Department of Agriculture and has been assigned a public patent. The product, which apparently is about ready for production in the form of wafers, sticks, or croutons, consists of skim milk, potato, water, and flavoring. Small and low-grade potatoes may be used, thus suggesting an important new outlet for surplus potatoes.

The new food is made by whipping air into a mixture of skim milk, riced boiled potatoes, and suitable flavoring, drying slowly on a screen at about 185 degrees Fahrenheit as it is extruded through an orifice, and toasting to a light-brown color. The skim milk is essential to the process, since whipped potato alone will dry to a hard, horny substance. Fats and oils destroy the whipping properties.

The plain wafers have a cheeselike flavor which originates in the casein of the skim milk. Some have been coated with commercial cheese to emphasize this flavor. Ground cooked vegetables, including spinach, carrots, and peas, have been added to some batches but without any outstanding addition to the flavor. A member of the Institute's Department of Biology and Public Health has sampled the wafers and feels that their blandness of flavor is probably their only disadvantage. However, there still remains the possibility of using the new food product compounded with other foods.

### *Two Hundred Million Tons*

CHIEF of the secondary metals, scrap iron is the material from which this country makes somewhat more than half its steel. Japan and Italy are forced by inadequate coal and iron-ore reserves to use even higher ratios of scrap to pig iron.

For steelmakers, the great virtue of scrap iron is that it is a by-product which is always available at a price high enough to cover the cost of collecting and transporting it. Conservationists, on the other hand, admire its ability to displace pig iron, every ton of which requires for its making two tons of ore, a ton and

a half of coal, and, roughly, half a ton of flux. Scrap is thus the most concentrated form into which the raw materials for steel can be compressed, the logical form for long-distance transportation.

Because Americans are surrounded by more automobiles, skyscrapers, golf clubs, railroads, pots and pans, and similar worldly goods than are any other people, the United States is the world's largest source of scrap iron, the only one with a sizable surplus for export. In the past seven years, the period during which scrap exports have been large enough to attract much attention, this country has produced 210,000,000 tons of scrap. Of these 210,000,000 tons, slightly more than 90 per cent was used within the United States. The remaining 9 per cent went mostly to Japan, Italy, and Great Britain — the last two countries competing neck and neck for a poor second place.

### *Drying by Freezing*

WHEN printers try to speed up their presses, they sooner or later — mostly sooner — discover that the ink isn't being given enough time to dry. Getting ink into such state that the surface of the printed sheet will neither be smudged by, nor smudge, the sheet above it, is done by absorption, evaporation, oxidation, and polymerization. Now freezing is added to the list.

Comes an ink which at room temperature is emphatically a solid. It is delivered to the printer as a block which must be broken and fed to the ink fountain like so much type metal. In the ink-feeding mechanisms of the press, however, it is heated to about two hundred degrees Fahrenheit, at which temperature it has the necessary fluidity for printing.

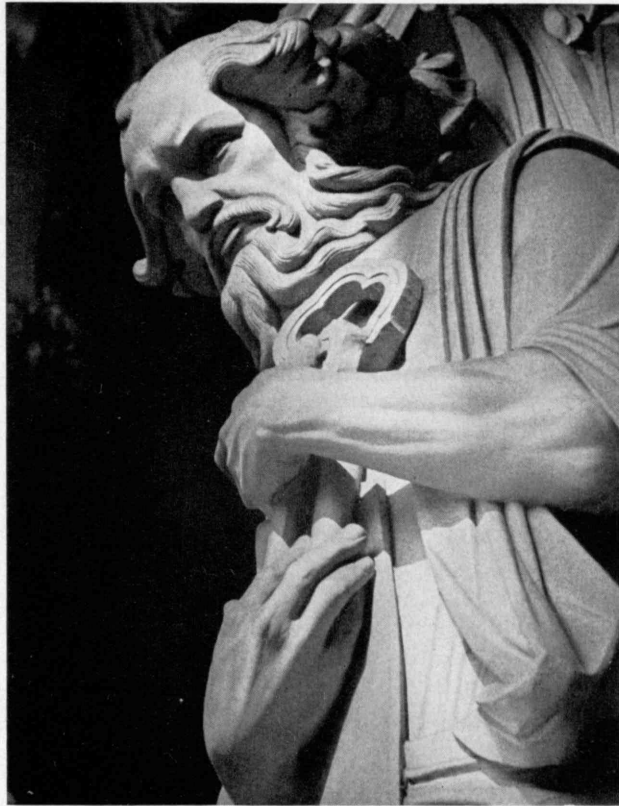
Since ink is deposited on the paper as a series of dots and thin layers which have more surface than mass, it almost instantaneously assumes the temperature of the room, regardless of its temperature on the press. Hence, the ink solidifies, or "freezes," before it reaches the temperature of the paper — freezes too quickly for penetration into the paper. Regardless of the stock used, the ink remains in relief unless the paper is again heated. Thus penetration can be controlled, eliminating danger of strike-through and the need to make the paper any thicker than is required for strength and opacity.

It is also claimed for the process that cold ink's indifference to capillary action makes possible much sharper impressions on porous stocks, such as newsprint, than would otherwise be possible. Frozen ink wouldn't blot on a blotter.

### *Good Earth?*

LIKE an elderly bookkeeper's metatarsals, the automobile performs most effectively on hard, smooth pavement. At the Iowa State College, a study of rural mail-carrying vehicles shows that gasoline and oil costs go up substantially as the road changes from pavement to earth, and that maintenance costs are even more quickly affected by the nature of the road surface. For the cars used in the test and on a basis of 15,000 miles annually a car, the cost of operation is 36 per cent higher on earth roads than it is on paved roads.

*The figure of St.  
Peter at the Cathed-  
ral of St. John the  
Divine in New York  
City*



*R. W. St. Clair, '36*

# Religion in a Scientific Era

*In a Great Realm of Spiritual Values Religion and Not  
Science Has Its Role*

BY KARL T. COMPTON

THE question of the relationship between religion and science is one of perennial vitality, to which both critical and speculative thinkers constantly return. In the light of men's spiritual hopes and material preoccupations, it is natural enough that they should do so; and, since definition and analysis are so exceedingly difficult when they deal with imponderable and sometimes emotional matters, natural enough that agreement on the issue should practically never be reached.

When, as is so often done, the question is put thus: "Is there a conflict between science and religion?" the answer depends upon the claims of the religion. If a religion essays to make pronouncements regarding the materials, laws, and forces of nature — whether laws of physics or astronomy in the inanimate world or laws of biology or heredity in the animate world — then that religion will certainly come sooner or later into conflict with advancing knowledge of science and will certainly be the loser in the conflict. Religious persons of fundamentalist leanings may resent this situation and may lay the blame on the upstart scientists of the last hundred years who have rushed in where angels feared to

tread. If any feel thus, I would refer them to a *real* fundamentalist of fifteen centuries ago, St. Augustine, who wrote: "There is some question as to the earth or the sky, or the other elements of this world — respecting which one who is not a Christian has knowledge derived from most certain knowledge or observation: and it is very disgraceful and mischievous, and of all things to be carefully avoided, that a Christian speaking of such matters as being according to the Christian scriptures should be heard by an unbeliever talking such nonsense that the unbeliever, perceiving him to be as wide from the mark as east and west, can hardly restrain himself from laughing."

St. Augustine's admonition, however, has often been ignored. While Benjamin Franklin was making his experiments on the nature of lightning, and his invention of the lightning rod was finding wide and successful use in New England, some of the great clergymen of Boston became highly disturbed over such sinful interference with God's power to strike his wayward children with fear and punishment through thunder and lightning. And when an earthquake shook the region, the pulpit



proclaimed it as God's warning against such interference with his powers. This tacit claim of religion to final judgment on a physical matter certainly reduced the respect held both for the clergymen and for their religion.

Science has not encroached upon the basic functions which religion rightly claims — those having to do with man's aspirations, his ideals, and the motives which guide his emotional adjustment to the world and to his fellow man. Even here science may at times play a role through correction of glandular disorders or psychological maladjustments which so often warp man's outlook on life and lead to antisocial or irrational behavior. But, granting all this, I believe that there is a fundamental religious instinct in man that craves expression, and that there is a great realm of spiritual values and satisfactions in which religion and not science has its role.

With these observations as a background, let me proceed to a few more positive considerations. The sources of such conflicts as have occurred between religion and science are to be found in matters which are really no part of religion. A few centuries ago, for instance, the idea that the earth was not the center of the universe was held to be a deathblow at the Scriptures, for was it not declared that the sun riseth in the East and setteth in the West, and that the stars run through their orbits? The acceptance of our present astronomical concepts was one of the greatest wrenches in the early Christian church, for it was the first of a long series of defeats of the then existent ideas of "infallibility and limitless authority" in which the organized church had clothed herself.

A second wrench came with the acceptance of the earth as round. Navigators even before the time of Columbus knew its shape, though their ideas about its size were inaccurate. But the church fought this knowledge, pinning its faith to the biblical phrase "the four corners of the earth." At one stage in the controversy a queer compromise appeared: Maps of the known world were given a shape like a bulging square, or a circle distorted with four cusps, in order to keep the notion of four corners and yet to give grudging recognition to the knowledge of navigators and astronomers.

In our own day, many churches have been fighting a similarly losing battle against the theory of evolution. Some twenty-five years ago, when my wife was in Young Women's Christian Association work, she visited many colleges where the teaching of evolution was forbidden and even the name was mentioned only in whispers. Groups of girls used to request her to meet them off campus and enlighten them as to the meaning of this forbidden subject. Yet for several generations scientists have seen disclosed in the study of skeletons and fossils an increasingly clear record of evolution in the age-long development of plants, of animals, and, to some extent, of man. But what is more, we are now producing new species of plants and animals in our laboratories, using x-rays or radium or certain chemicals to accelerate processes which have certainly been going on naturally ever since life has existed on this planet. It is even reasonable to expect that this controlled process of evolution may soon be in commercial operation. A number of laboratories have been experimenting with it.

Thus many of such conflicts as have occurred between religion and science hinge on matters which either are the remnants of old superstitions or are accretions which have become attached to religion like barnacles to a ship. Many of these accretions have come through the efforts of religious men to work out a philosophy of life in all its aspects and have become ingrained in church doctrines. But, like barnacles, they have impeded rather than aided religious progress. I believe that science has rendered a great service to essential religion in unshackling it from these incumbrances and thus assisting it in developing more clearly its fundamental objectives.

The impact of science on religion has emphasized the dynamic, as opposed to static, character of religion. An extreme example of static attitude is implicit belief in the literal accuracy and permanent perfection of the scriptures of the Jews or the Bible of the Christians — an attitude which may be illustrated by an incident in my own experience. As is generally known, the age of the earth is estimated at something less than ten thousand years by those who interpret the Old Testament as an infallible historical record of events. Yet by the most accurate measurement of the age of rocks thus far discovered — by their content of radioactive materials and products — scientists hold that they can date the earth in terms of hundreds of millions of years. I once asked a fundamentalist professor in a Christian theological school how he could abide by the literal historical interpretation of the Scriptures as giving the earth an age of less than ten thousand years. He replied: "You scientists make the assumption, which you cannot prove, that the scientific laws which you find true today were also true a thousand or more years ago. I prefer to make the assumption that the Holy Scriptures are absolutely accurate."

Seeing that I could not reach common ground here, I tried the second question: "Which is more important, the virgin birth of Jesus Christ or his teachings, by word and by example, regarding the attitude that men should take toward their fellow men and toward God?" He replied: "The virgin birth is by far the more important because if this be not accepted, we have no basis of authority on which to accept his teachings." I tried to argue that the teachings stood on the authority of their own merit, as proved by experience; and that it would seem strange to me to place the ideals which Christ exemplified, and to which he devoted his life, in a position subordinate to the manner of his birth. But again we could reach no common ground. The width of the gulf represented in this conversation is startling. Extreme case though it is, however, this illustration is typical of the static attitude in religious thinking.

The dynamic attitude is to view the scriptural record as the story of man's continual progress in evolving a religious attitude toward his environment and all that this environment implies. When this point of view is taken, grotesque contradictions disappear. We see the evolution of man's idea of God, from an anthropomorphic conception of numerous deities of capricious behavior and often conflicting purposes, through the notion of a single God who walked and bargained with men — who chastised them and repented — (*Concluded on page 336*)

# Cipher for Secrets

*Cryptography, First among the Odd Arts Attendant upon War,  
Is of Long History; Modern Secret Agents May  
Well Employ Ancient Techniques*

BY A. H. PHILLIPS

**A**MONG the odd arts attendant upon war, cryptography takes first place, for with censors clamping down in all directions and with espionage becoming a major, and very thriving, business, cipher writing steps out of the pages of secret-service fiction into everyday reality. It also, incidentally, steps out of the pages of history, for the art of secret writing goes back into the dim limbo of antiquity: The Greeks, as usual, had a word for it, and Julius Caesar invented a method that, after 1,900 years, still remains a headliner in the cryptographic textbooks.

To meet the cipher menace — and ingenious cryptography was the spy's most vital weapon in the World War — the combatant nations have speedily organized expert deciphering bureaus. The Germans call theirs the Chiffrierbüro; the French, Bureau de Chiffre; and the English, with a schoolboylike taste for the mysterious, Room 40. Routine work to these departments will, of course, be the job of deciphering enemy codes, but the toughest nuts they are called upon to crack are the hundred and one ingenious methods of secret writing, known as cipher, which are at the disposal of the spy fraternity.

Cipher, it is important to remember, differs from code in that cipher is a method of transposition or substitution of letter for letter in a message, whereas each combination used in code represents a definite word or, frequently, a whole sentence. The art of cipher, however, goes farther than mere compilation of a jumble of transposed or substituted letters and adds a headache to the task of the decipherment by clever methods of hiding the fact that a message is being sent at all.

Simplest and commonest forms of cipher still take their cues from century-old systems and, except in their methods

of concealment, adhere to standard form. Here, for

*Raw material of cipher  
— the alphabet*

*H. Armstrong Roberts*

example, is a typical case history, illustrating a more or less basic use of alphabetical cipher: M3, a confidential shipping clerk with inside information on sailing schedules, is employed as a secret agent by a government interested in all shipping movements. His immediate job is to convey, in writing, to another agent, X4, the sailing time of a ship we shall call the *Ajax*. Since the information has to be conveyed in writing, an alphabetical form of cipher will probably be decided upon. Out of the many means available, the choice will possibly fall on a variation of either the Caesar or the Vigenère system.

The idea behind Caesar's system is the transposition of the letters of a message two, three, or four spaces forward or backward in the alphabet, according to a prearranged key. For example, CROSSING RUBICON TONIGHT, enciphered to a key of four letters backward, becomes YNKOOEJC NQXEYKJ PKJECDP, which, though it no doubt had the Romans guessing, would not fool a modern cryptographer for any longer than it would take him to continue each letter alphabetically, in vertical columns, until the original message became apparent; thus:

Y	N	K	O	O	E	J	C	N	Q	X	E	Y	K	J	P	K	J	E	C	D	P
Z	O	L	P	P	F	K	D	O	R	Y	F	Z	L	K	Q	L	K	F	D	E	Q
A	P	M	Q	Q	G	L	E	P	S	Z	G	A	M	L	R	M	L	G	E	F	R
B	Q	N	R	R	H	M	F	Q	T	A	H	B	N	M	S	N	M	H	F	G	S
C	R	O	S	S	I	N	G	R	U	B	I	C	O	N	T	O	N	I	G	H	T

If M3 and X4 used Caesar's cipher, however, they would probably concoct a cryptographer's nightmare by the use of irregular transposition; working, let us say, to a prearranged key of 4, 8, 2, 3, 6 backward, M3's cipher message with reference to the *Ajax* would read WBYUMWJJPZENCJIJVVYV. With the key in your possession, this is easily transposed. First, the message is written with the key over each letter; then the transposition is made according to the number indicated:

	4	8	2	3	6	4	8	2	3	6	4	8	2	3									
	W	B	Y	U	M	W	A	J	P	Z	E	N	C	J	I	J	V	V	Y	V			
1	X	C	Z	V	N	X	B	K	Q	A	F	O	D	K	J	K	W	Z	W				
2	Y	D	A	W	O	Y	C	L	R	B	G	P	E	L	K	L	X	A	X				
3	Z	E		X	P	Z	D		S	C	H	Q		M	L	M	Y		Y				
4	A	F		Q	A	E			D	I	R			M	N	Z							
5	G		R	F			E	S				N	A										
6	H		S	G		F	T		O	B													
7	I			H			U																
8	J			I		V																	
	A	J	A	X	/	S	A	I	L	/	S	/	F	I	V	E	/	M	O	N	D	A	Y



# PLAIN-TEXT LETTERS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
B	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a
C	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b
D	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c
E	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d
F	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e
G	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f
H	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g
I	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h
J	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i
K	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j
L	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k
M	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l
N	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m
O	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n
P	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Q	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
R	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
S	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
T	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s
U	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t
V	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u
W	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v
X	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
Y	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
Z	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y

Fig. 1. Resembling a safe, "since it is anybody's property but not worth a hoot unless you have the combination to crack it," this maze of letters is among the aces of all alphabetical cipher systems even today, four and a half centuries after its invention by Blaise de Vigenère, French diplomatist of the Sixteenth Century.

Perhaps the unscrambling looks easy, but get someone to give you an equally simple message, without the key, and you will, after a few days, begin to appreciate that searching for a needle in the proverbial haystack is a nursery game compared with the cryptographic hide-and-seek that is still involved in unraveling even so hoary an old-timer as Caesar's cipher.

But we shall presume that M3 and X4 are experts at their game, who realize that however much you complicate the Caesar cipher, it is A-B-C stuff to a trained and clever cryptographer. Moving ahead fifteen centuries, they therefore decide on the Vigenère system, which was invented by a Sixteenth Century French diplomat, Blaise de Vigenère, and remains to this day among the aces of all alphabetical cipher systems.

Basis of this 400-year-old cipher is Fig. 1 (above), which may be said to resemble a safe, since it is anybody's property but not worth a hoot unless you have the combination to crack it. With this table M3 gets busy enciphering his message. First, he cuts it to an understandable minimum — AJAX FIVE MON —

## THE TECHNOLOGY REVIEW

and then "keys" it with the word "eight," the reason for which will be apparent later:

A J A X F I V E M O N  
E I G H T E I G H T E

Now let us follow him as he commences to cipher. The left-hand column of capitals in Fig. 1 represents the letters of the key word, and the top column of capitals, the letters of the plain-text message. The main body of the table represents the eventual cipher letters. The point where the horizontal line from a key letter meets the vertical line from a text letter is the cipher substitute. Thus, the first key letter *E* meets the first text letter *A* at the cipher substitute *e*; the second key letter *I* meets the second text letter *J* at *r*; the third key letter *G* meets the third text letter *A* at *g*; and so on. Try it for yourself, and you will be able to follow M3 as he makes out the following cipher substitutes:

A J A X F I V E M O N (Text)  
E I G H T E I G H T E (Key)  
e r g e y m d k t h r (Cipher)

Even in this short message, you may notice something interesting — that the two *A*'s in the four-letter word "Ajax" are each ciphered by a different substitute and that *e* in the cipher stands for both *A* and *X* in "Ajax." Therein lies a feature that has made the Vigenère cipher an all-time classic in the cryptographic world, for, as you can test for yourself, a plain-text letter in the original message can be represented in the cipher by any one of the twenty-six letters of the alphabet. Thus *A* in a single message can be repeated twenty-six times and every time by a different letter. If a patron saint be sought for the secret agents of the world, his name must undoubtedly be Blaise de Vigenère.

So far, plain sailing, but M3 has now to send the cipher message to X4. He knows that members of the secret service are keeping eagle-eyed tabs on everyone working in the shipping office and particularly on anyone who, like him, has access to any schedules. To send a jumble of unconnected letters, obviously cipher, by mail or telegraph is therefore to court disaster. Of course, he can resort to the use of a secret ink, but this is old-fashioned technique in these days, and M3 knows that between the newly invented vaporizing reagents and ultraviolet photography, the use of invisible inks is likely to prove disastrous. (Continued on page 336)

# Nutrition and National Health

## *Dietary Deficiency Is Widespread and Serious, with More Than 40 Per Cent of the Population on Inadequate Rations; Nutritional Defects as Sources of Disease*

BY THOMAS PARRAN, JR.

**T**WO generations ago, the discovery of the bacterial causation of disease opened up a whole new world for medical and health progress. Today, the newer knowledge of nutrition opens up a comparable territory ripe for conquest. The science of nutrition stands now about where the science of bacteriology stood at the turn of the century.

I should like here to discuss the prevalence of malnutrition in the United States; the evidence concerning nutritional status and the major specific deficiencies; the relationship between the state of nutrition and the incidence of acute illness, chronic disease, and the span of life; and the practical steps which seem indicated to promote the national health through application of what we *now* know concerning nutrition.

We have not yet determined the exact nature and extent of the nutrition problem, yet every survey — by whatever method and wherever conducted — has shown that malnutrition is widespread and serious. There is a vast — possibly one to ten — difference between optimum nutrition and frank clinical manifestations of dietary deficiency. More and more emphasis, therefore, must be placed upon optimum and not minimum standards. Our nutritional aim should be existence not merely at a bare margin above the starvation level but at the level which produces abounding health and vitality. Subclinical, or latent, malnutrition is the largest and the most dangerous part of our problem. Like an iceberg, the greater part of it is under the surface.

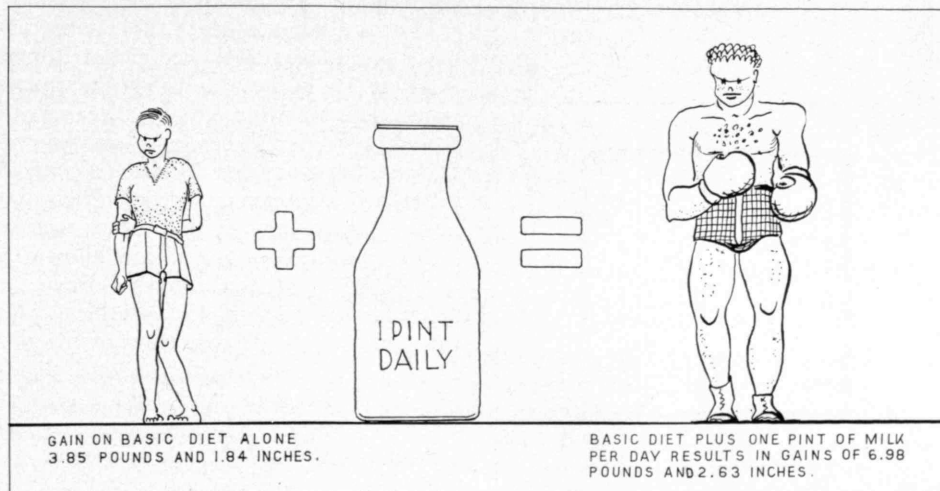
Of the many causes of unsatisfactory nutrition, the principal but not the only one is faulty diet. The dietary intake is influenced by economic factors — such as the

lack of purchasing power for food, and modern methods of manufacture which involve overrefining of foods; and by educational factors — such as poor preparation of food, fixed food habits, poor planning of menus through lack of dietary knowledge; as well as by modifications in nutrition which are due to illness and treatment.

The traditional method for measuring the nutritional status of individuals and of population groups has been through surveys of dietary consumption, comparing foods actually consumed against the best-known standards of what constitutes an adequate diet. Further evidence is available from the effects of supplementary feeding of controlled groups. Records from clinical examinations and physical measurements, particularly of children, also are available. However, both the dietary studies and clinical examinations, including physical measurements, have definite limitations in selecting individuals with nutritional defects. In recent years a number of new laboratory techniques have been developed which give highly accurate information for the detection of the earliest manifestations of specific dietary deficiencies. At present such tests are not available for all deficiencies, but a considerable number of these techniques have been moderately well standardized, and their use in population groups throws much light on many heretofore hidden states of malnutrition.

In recent years numerous surveys of family diets have been made by several governmental agencies. The most comprehensive studies are those of the Department of Agriculture. These show definite correlation between food intake and income level. More than 40 per cent of

the people of the country are not getting a diet adequate to maintain good health and vigor. For this portion of the population, diets are poor in respect to specific essential elements, particularly vitamins A, B<sub>1</sub>, and C, and calcium. Moreover, the actual amount of food consumed by low-income families is less than that necessary for normal health. The foods of which we, as a nation, have an apparent surplus are those in which the national dietary is deficient — milk and milk products, citrus



J. Martin Rosse, '40



fruits, green vegetables, and meats. It has been estimated that if we were to provide a liberal dietary for our whole population, national food consumption would be increased as follows: vegetables and citrus fruits and others, 50 to 75 per cent; butter, milk, and eggs, 50 to 94 per cent; meats, 10 to 30 per cent. If these levels of food consumption could be reached, there would be not a surplus but an actual deficiency for many products. In fact, it has been estimated that there is no real surplus of food production in this country except in wheat.

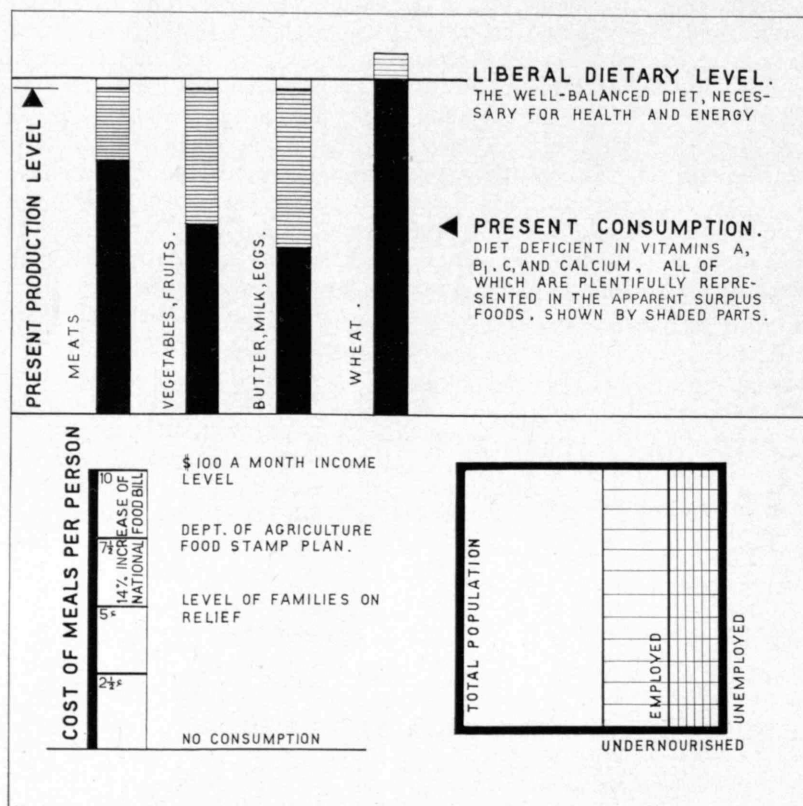
Numerous studies of supplementary feeding have, without exception, resulted in improved nutrition, indicating that the previous diet had not been adequate. At least ten such feeding experiments with children have shown remarkable acceleration in the growth and physique of the children as a result of additional food. In 1926 in a school near London, Dr. H. C. Corry Mann made a classic experiment in feeding: Separate groups of boys were fed in different ways, and close records were kept of weight, height, and physical fitness. One group, on a basic diet presumably adequate, gained 3.85 pounds and 1.84 inches. Another group, fed one pint of milk a day, in addition to the basic diet, gained 6.98 pounds and 2.63 inches. "With no deficiency in fresh air or sunshine an immediate improvement in physique followed an alteration in the quality of diet which was adequate from a physiological standpoint." The gains were not temporary but were maintained over a period of years. There was an 81 per cent greater increase in weight and a 42 per cent greater increase in height caused by the added milk. Dr. Mann says: "The casual visitor would never fail to recognize the boys receiving the extra ration of milk; [they were] obviously more fit." In a more recent report, Lydia Roberts has shown

that adding an extra pint of milk to the diet of children already receiving a presumably adequate diet, results in increases in height and weight amounting to as much as 20 per cent greater than for those not receiving extra milk. Moreover, many surveys here and abroad show that the height, weight, and vigor of children are less among the poor than among the well to do. Families on relief consume 20 per cent less calories than the minimum necessary for health. Lack of vitamins (especially the B complex) causes a lack of appetite and creates a vicious circle.

From clinical reports, evidence is added concerning the prevalence of deficiency diseases. W. H. Sebrell and V. P. Sydenstricker independently estimate an occurrence of 100,000 cases of pellagra in the South each year. Although regional differences exist, deficiency diseases are not limited to any geographic area. An outbreak of scurvy in Maine was widely publicized a year ago. Studies there made by the Children's Bureau showed that from 30 to 55 per cent of the children — depending upon the season — had abnormally low ascorbic acid levels in the blood plasma, indicating a shortage in vitamin C. A study of the diets of these children showed that probably not more than one child in seven was eating, as often as once a day, any food that is a good source of vitamin C.

In a children's clinic in Toronto, F. F. Tisdall and E. W. McHenry have reported only 16 per cent of the infants as having a blood ascorbic level believed to be consistent with good health. In the same city, among 400 families having incomes of \$10 to \$19 a week, the men received only 77 per cent of the needed calories, the women 70 per cent. Measured by accepted standards, these families were consuming one-third the amount of milk, one-half the amount of iron, and two-thirds of the amount of calcium which they needed. In a clinic in Augusta, Ga., Sydenstricker has reported, in 15 per cent of all patients, nutritional edema due to a low intake of protein; and in 35 per cent of all admissions, nutritional anemia due to lack of iron. Through study of high-school children in a poor area of New York City, Public Health Service investigators found a serious shortage of calcium and vitamin B<sub>1</sub> in the diets.

Recent studies indicate that many diseases heretofore not classed as nutritional in origin are in fact due to specific nutritional defects. Almost daily, diseases are added to the list. It has long been known that beriberi is caused by a deficiency of vitamin B<sub>1</sub> (thiamin); that pellagra is due in part to a deficiency in another section of the vitamin B complex, now known to be nicotinic acid; that scurvy is due to a deficiency of vitamin C (ascorbic acid); that rickets is due to a shortage of vitamin D which influences calcium and phosphorus metabolism; and that a lack of vitamin A causes night blindness, xerophthalmia, and a lack of resistance to infection.

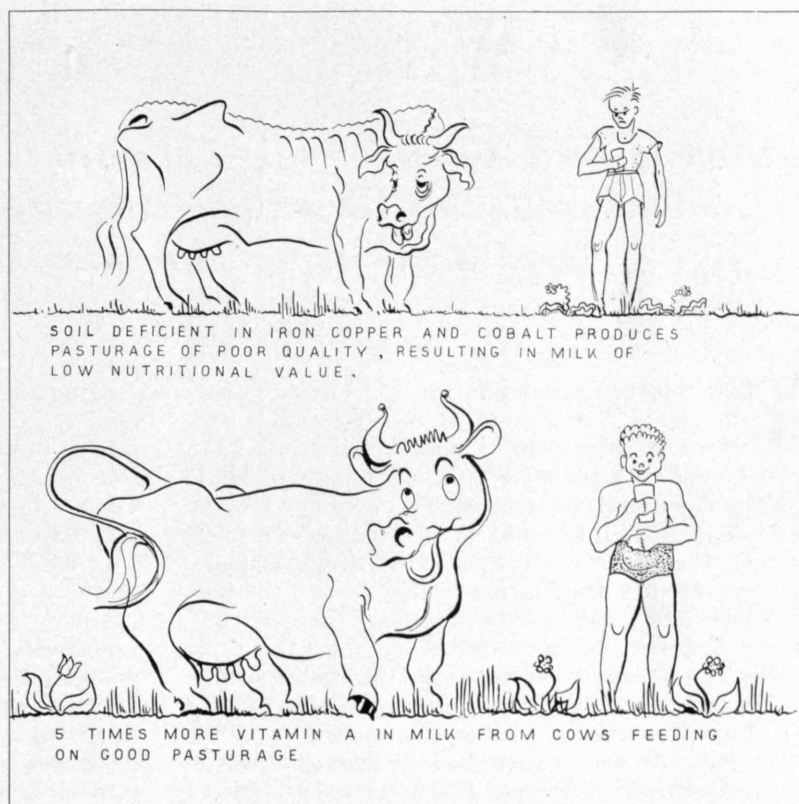


Recent studies by Sebrell have shown that a lack of riboflavin causes a specific skin disease, keratitis. In fact, interstitial keratitis, which is such a frequent complication of congenital syphilis, may be due to a deficiency of riboflavin and may be cured by nutritional methods. E. T. Ceder has shown that the intractable skin disease, psoriasis, is amenable to massive doses of vitamin C. Severe facial neuralgia — the hideously painful *tic douloureux* — is relieved by vitamin B<sub>1</sub> and liver extract. Many symptoms of chronic alcoholism are now known to result from vitamin starvation. Dramatic cures of cases of delirium tremens are reported following the administration of vitamin B<sub>1</sub>. A deficiency in magnesium may be a factor in tetany, other cases of neuromuscular irritability, and even convulsions. Cirrhosis of the liver, so often associated with chronic alcoholism, seems to be of dietary origin. Gallstones and stones in the bladder are producible in animals by diets deficient in vitamins and unbalanced in mineral content. Some toxemias of pregnancy are due to lack of protein. Many vague and ill-defined symptoms are relieved by dietary treatment. Arthritis is frequently due to low ascorbic acid and may be relieved by vitamin C.

The prompt cure of pellagra by nicotinic acid gives dramatic evidence of the influence of a minute amount of a dietary essential, not only upon physical but upon mental illness. In previous years 10 per cent of the patients in mental hospitals in the South were insane because of pellagra. One or two doses of the powerful nicotinic acid or its amide produce prompt cure. Delirium and mania disappear overnight. The patient becomes calm and mentally clear. The severe skin rashes clear up. The red, swollen tongue no longer protrudes from the mouth. In a week or two the bedridden patient feels like going to work.

One might ask why should not the diet of the people in the South be supplemented by regular administrations of nicotinic acid. The drug is useful in treating acute cases, but even though the specific symptoms of pellagra clear up, the patient still is not well nourished. The pellagrin usually suffers from a multiplicity of nutritional disorders. In truth, deficiency diseases rarely are single and specific. This fact is easily understood when one realizes that persons obviously would not choose a diet complete in all except one respect.

Children with pellagra, both in the manifest and less clearly defined forms, are below normal in height and weight. Their progress in school is slow. They are unable to concentrate, have poor appetites, are cross and fretful, and cry easily. The malnutrition of these children frequently starts before birth. Undernourished mothers produce sickly babies and, in the process, drain from their own already depleted bodies calcium, phosphorus, iron, and essential vitamin reserves. These children show a spectacular improvement following a protective food



J. Martin Rosse, '40

diet, which means milk, green vegetables, fish, and meat. The mother who has an inadequate diet is unable to nurse her baby; dietary deficiency is probably the chief single cause of failure of a mother's milk supply.

Some patients with severe mental disease, showing no clinical signs of pellagra, recover promptly when given nicotinic acid. Dr. H. M. Cleckley recently reported nineteen such stuporous patients. He used the remedy on a hunch. "Response to nicotinic acid was striking. . . . In four cases the vitamin seemed to contribute greatly to improvement; in the rest, 'cure' was dramatic. . . . Nicotinic acid was life saving in practically all of the group and [Cleckley] is equally certain that many persons have been allowed to die because of a failure to recognize the cerebral symptoms of pellagra when other evidences of the disease are absent."

The growth of children is retarded by poor food. As previously stated, many surveys here and abroad show that the height, weight, and vigor of children are less among the poor than among the well to do, and their physical condition is unsatisfactory. Teachers comment almost uniformly upon the noticeable improvement in physical vigor and mental alertness following a mid-morning meal or a well-balanced school lunch. In our educational system we are wasting much money trying to teach children with half-starved bodies and minds. We shall spend tomorrow on the care of their sickness many times over what we save today on food which would prevent it. Moreover, our own people are the greatest potential market for American agriculture. Nutrition is a national, as well as an individual, problem.

From years of debate among doctors as to whether or not a fully adequate diet increases resistance to disease, certain facts are becoming (Continued on page 344)



# Wild-Life Portraiture

*To Show Bird, Beast, or Bug in Satisfying Composition Against a Background at Least Suggesting Habitat Tests Patience and Good Humor, Provides Much Pleasure*

BY HENRY B. KANE

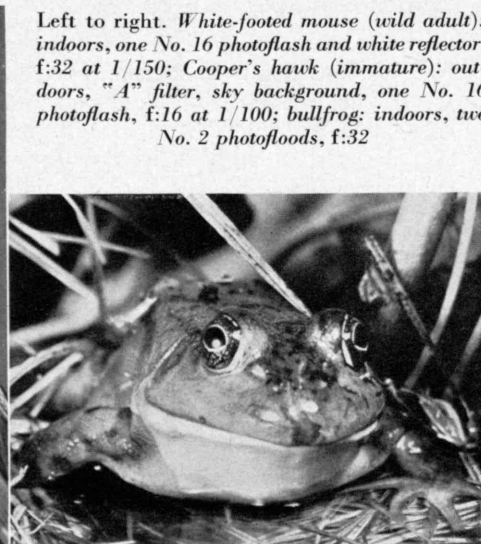
THE night the skunk ran riot in the upstairs bedrooms was a bit trying. It wasn't so much ourselves we were worried about — we could have been buried without much trouble. It was the house itself — it would have taken such a very large hole for the whole house. We discovered some weeks later, though, that we really hadn't known trouble before. That was the morning I awoke to discover that fourteen pine mice had burst their bonds during the night and were well distributed in every nook and boot toe of the house. The fourteenth wasn't found until late evening.

Naturalists as a class are commonly regarded with a bit of eyebrow raising by the saner members of the community. An active interest in the lives and loves of Our Little Friends in Fur and Feathers is not considered quite normal. Photographers, too, are looked upon with a certain skepticism, particularly since the advent of the wild-eyed candid-camera fan and his frequently ludicrous exhibitions of individuality. Put the two together to produce a nature photographer and you've wedded the more insane portions of two much-misunderstood fields of endeavor. I am a nature photographer.

Nature photography sounds like a pretty specialized field, and yet it's really an all-inclusive term descriptive of nothing in particular. It has three main working divisions, related only in the matter of their subject material: First of these is the scientific aspect, which has the sole objective of producing accurate recordings of detail for future study or reference. This branch is self-explanatory and need not concern us further here.

Second is a phase which is achieving increasing popularity — camera hunting. This is the sort of work which George Shiras has done so successfully for years. Any *National Geographic* devotee is familiar with his results. Camera hunting is a logical combination of hunting, with its millions of practitioners, and of photography, with its growing ranks of millions more. There is, of course, a great amount of overlapping, and it is only logical to assume that more and more the camera is supplanting, or at least complementing, the gun as the preferred form of field equipment. It really should have achieved much greater recognition as a form of sport long since. Just think how many things there are to recommend it: no closed seasons, no taboo against standing shots, no bag limit, no stigma attached to small-game hunting — a mouse is as good as a moose. Even jacking is permissible. And when the heat of the chase has cooled, it's much more pleasant to work with D76 than to clean a stiffened carcass, and nowhere near so much dust collects on a framed 11 by 14 as on a many antlered, glassy-eyed head. Probably the main drawback to the popularity of camera hunting is the fact that it's too difficult. A high-powered rifle with a telescope sight will do in a buck at five hundred yards. You couldn't get a recognizable shot of him with a six and a half inch lens at much more than thirty feet. The Nimrod prefers his hunting the easy way.

But I'm really in no position to talk about this hunting aspect. I used to go rabbit hunting with a sealing gun, and with a camera I've rarely stalked anything



Left to right. White-footed mouse (wild adult): indoors, one No. 16 photoflash and white reflector, f:32 at 1/150; Cooper's hawk (immature): outdoors, "A" filter, sky background, one No. 16 photoflash, f:16 at 1/100; bullfrog: indoors, two No. 2 photofloods, f:32

All photographs by the author

more sprightly than a turtle. My work has been confined largely to the third and most recent division of nature photography, which I like to call wild-life portraiture. It bears the same relationship to camera hunting that studio portraiture does to candid-camera work in the field of higher mammals.

The object of a wild-life portrait is to show an animal (bird, bug, and so on) against a background at least suggesting his habitat. The attempt is made to secure a satisfying composition, so that even though the viewer doesn't know whether he's looking at a chipmunk or a chickadee he still feels that, as a photograph, the composition is pleasing. This result is rarely, and then only accidentally, achieved in either of the first two classifications. It is the principal aim in the third.

Time was when there were only two kinds of so-called nature photographers: purists and fakers. The purist sometimes went to the ludicrous extreme of branding as fake any picture in which so much as an interfering branch or blade of grass had been removed. Nature hadn't made it that way! I've watched some of these men, through their writings — watched them change their thinking as the years went by and they discovered more imaginative men producing superior results. Today the purist exists only in the realm of scientific recording, his natural field. The term "faker" is reserved for the man who deliberately sets out to misrepresent, attempting to pass off museum shots as the real thing or, sometimes unintentionally to be sure, posing animals in incongruous juxtaposition or surroundings — a kingfisher sitting on a turtle's back, for example, or a mouse sitting on a lichen which is upside down. In between is the entirely legitimate and rapidly growing field of wild-life portraiture. It is this field which we shall explore, on the assumption that many will find it pleasurable.



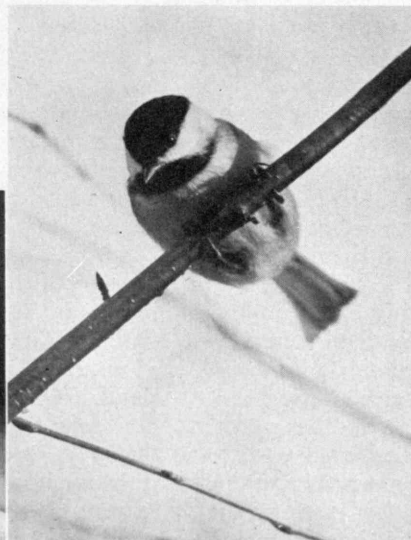
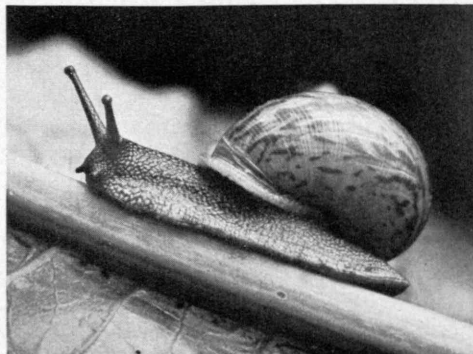
*Lady's-slippers: indoors, stump background, two No. 2 photofloods, f:32*

To begin with, what sort of equipment is needed for this work? Well, let's take a look at the requirements. You'll want to be able to get pretty close to some of the smaller objects, and when you do, you'll need as much depth of focus as possible. A camera with a ground-glass back or a reflex camera is indispensable if you really expect to pay much attention to composition. The size of the negative is open to some debate, but in general the largest size which you consider to be economically justifiable is the best. A good average is  $3\frac{1}{4}$  by  $4\frac{1}{4}$ , for sometime you may want to make 11 by 14 prints, and you can't believe all you read in the ads about fine-grain developers and emulsions. There's still a definite loss in clarity with a greater-than-

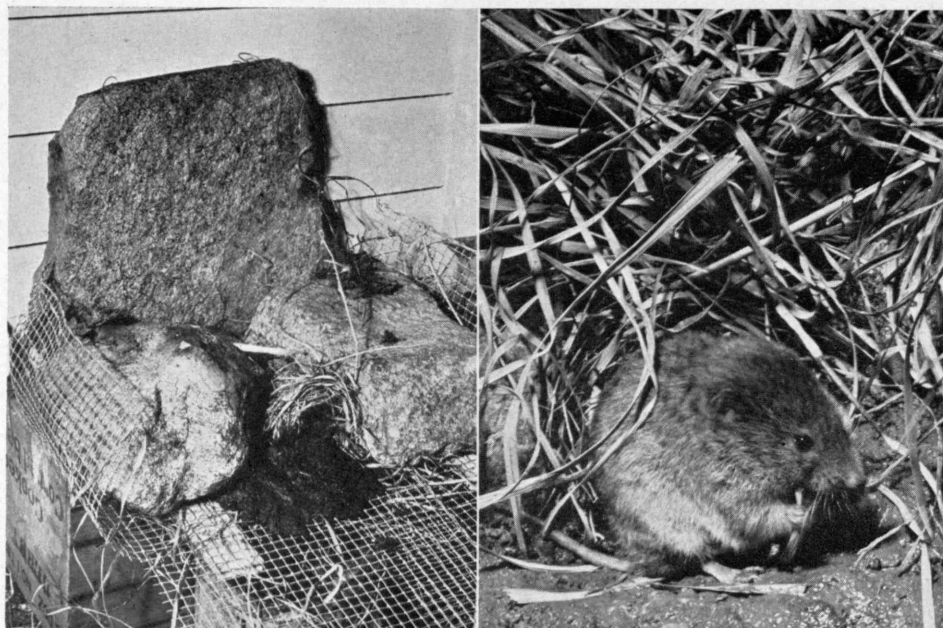
ordinary blowup, and in wild-life photography sharp detail and clean lines are wanted in ninety-nine out of a hundred cases.

These are the principal requirements for the camera itself. One type which meets them is the double-extension, focusing-back camera with a lens speed of  $f:4.5$ . Mine is a Zeiss Maximar B, and no matter how many cameras I may eventually have, this is one type that will always be indispensable. It has a Zeiss Tessar  $f:4.5$  lens and takes a film 9 by 12 centimeters. Eastman, Voigtlander, and several other manufacturers turn out almost identical models. Plates, cut film, or film pack may be used interchangeably. For a number of reasons I prefer cut film. There are also certain "must" accessories, such as a lens shade, sky filters, and a good, sturdy tripod. A dependable exposure meter is practically a necessity, and without a photoflash synchronizer you'll have to forego many a shot. For relatively still-life indoor setups you can use floods, and you'll therefore need some reflectors — two will do for a start.

Left to right. Garden snail: indoors, two No. 2 photofloods, f:32; chickadee: outdoors, setup at feeding tray, full winter sunlight, f:16 at 1/200; woodchuck (young): indoors, one No. 16 photoflash, f:32 at 1/200







Left. Mailing-tube setup for meadow-mouse pictures, before being covered with grass. Right. Meadow mouse, taken at mouth of tube,  $f:32$  at  $1/200$

Assuming, then, that you have the equipment and know how to use it, what do you do next? Let's start with one of the easiest live subjects, a frog — preferably a full-grown bullfrog who's too indolent to hop around much. His outstanding features are his eyes, which project an unbelievable distance above his head, and his mouth, with its ear-to-ear grin. The only angle which will show both mouth and eyes to best advantage is a head-on view looking up under the chin to a slight degree. So take a large pan (a dishpan will do), line it with a piece of black cloth to kill underwater reflections, and fill it to the brim. Behind the far end of the pan set a box and on it place a few clumps of marsh grass or ferns. In the water itself set a very few stalks of pickerelweed or arrowhead. Then, on a lily pad held at the surface by some underwater support, set the frog. He'll jump off a few times but will soon realize the futility and resign himself to his fate. Photofloods are easily fast enough for him. Use two No. 2's — one set just above, and at one side of, the camera; the other, on the opposite side about twice as far back. Don't leave them on any longer than necessary, as the heat will soon send the frog in for another bath. Before you shoot, get your eye down as near the lens as possible; you may spot an interfering leaf or twig which is not apparent from above. Stop down all the way, probably to  $f:32$ . Your lens will be almost at water level — probably no more than 30 to 36 inches away — and you'll therefore need all the depth you can get.

Toads, tree frogs, salamanders, many of the insects can all be taken with no more trouble than this. One extremely important thing to guard against, however, is the error of making the background so confusing that the outlines of the subject itself are lost. In other words, don't let your setup get too "busy," as some photographers like to call it. Two things aid in minimizing this possible pitfall anyhow: The first is the fact that at these short distances the background, if more than six inches

or so behind the spot on which you are focused, will be sufficiently out of focus to appear to be in another plane. This condition, incidentally, creates a very welcome third-dimensional effect. The second is the fact that when the subject is so near the light source, intensity drops off fast between foreground and background; as a consequence, the foreground stands out more distinctly than the background.

The use of two light sources introduces one problem which is of relatively minor importance, namely, double highlights in the eyes. They are easily corrected by retouching, but if that is considered objectionable, the second light may be replaced by a white reflector on the

shadow side. The main objection to this is the fact that it adds one more prop at the point of action — and when a frog really starts leaving the scene, the clearer the decks are, the easier is his recapture.

Having started with more or less docile subjects, let's turn next to a more active class, animals of a more nervous temperament — mice, squirrels, woodchucks, and so on. Of course if you can find some tame ones or almost matured youngsters, they're easier to handle. Some of the smaller mammals, such as meadow or white-footed mice, can be worked with readily even when taken full grown from the trap, but most adult wild animals are hopeless for this sort of thing. Assuming, then, that you have a fairly tractable subject, let's see how to go about photographing him.

First of all, you'll need to use flash lamps. It's perfectly possible to do successful work without a synchronizer by operating the shutter on "bulb" and flashing the lamp manually, but that procedure is far from satisfactory. A synchronizer is practically essential. Don't fool with a cage. That's one method that has been widely advocated and which can work, but a totally enclosing glass cage imposes so many restrictions that, except in rare circumstances, it's not advisable. The glass through which you must shoot introduces reflections which can be eliminated only with difficulty; the mouse, or whatever you're taking, invariably tries to climb out and covers the cage with footprints; and, more often than not, he wants to lean against it, flattening out his fur on the side near the camera.

The most satisfactory method from the standpoint of results, if not from that of labor saving, is to use a small, totally enclosed room or porch. Except for the necessary equipment, it should be entirely cleared, so that you can chase your model around more readily when he decides to leave the place where you want him to stay, as he will quite often. Make your setup on a small table at camera height. (Continued on page 348)

# Myth and Metal

## *Migrations of Peoples and Dispersion of Knowledge Led to the Overwhelming of Bronze by Iron, Which the Mythology of Northwestern Europe Memorializes*

BY CLARK S. ROBINSON

MYTHOLOGICAL history is good history. But the mythology must be real — that is, must not have been distorted to serve as propaganda — and must be properly interpreted in the light of acknowledged facts. For example, the biblical myth of the Deluge could not be properly interpreted and classified as real history until recent excavations in Mesopotamia uncovered the actual remains of that historic event.

Modern descendants of northwestern European ancestry are fortunate in having both a real mythology uncontaminated by foreign influence, and a tremendous accumulation of acknowledged facts about that ancestry and its prehistoric activity. This material is fascinating — and not merely to those who are inclined toward ancestor worship and who may have been detected in the act of looking up ancestors in the archives of some genealogical society in the hope of qualifying for the Daughters of the American Revolution or the Mayflower Descendants. The period here discussed far antedates 1620, being that portion of the world's history between the years 2000 and 400 B.C., when an extraordinary series of events occurred which influenced our ancestors and us profoundly.

During the first millennium after Christ, emigrants from northwestern Europe, mostly from Scandinavia, settled in Iceland, founding on that remote island a successful and permanent colony. A collection of the mythological folklore of that Norse people, which work we now call the *Elder Edda*, or *Poetic Edda*, or the *Edda of Saemund the Wise*, was made about the year 1100. Approximately one hundred years later, an enthusiast by the name of Sturluson collected additional folklore, which we call the *Younger Edda*, or *Prose Edda*. These two works, protected in that remarkable island from corruption and destruction at the hands of foreign invaders and religious fanatics, constitute a very complete record of the mythology of the ancient Teutonic race. They give one side of the picture of a series of race-shaping events. The other side is supplied by a large group of modern investigators working in the interests of archaeology and of ethnology, who have excavated prehistoric villages, cemeteries, all sorts of spots where our ancestors have left traces of their life and work.

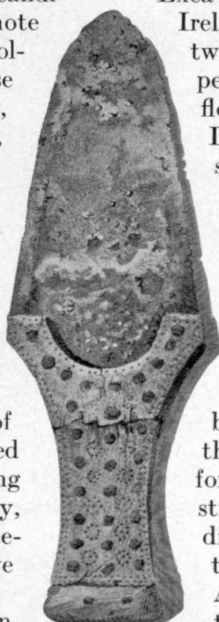
About the year 2000 B.C. the part of Europe in which we are interested was in what is called the Bronze Age, when tools, utensils, and weapons were made not of iron or steel but of that softer,

weaker alloy of copper and tin which is called bronze. During this age, the climate of northwestern Europe was mild and fairly dry; the bogs dried up and furnished rich, unforested areas that could be cultivated; the lake levels fell, so that villages could be built on their shores; the forests shrank in size; and agriculture was easy and fruitful. Life in those days was simple and uneventful, a sort of golden age in bronze. In Ireland, that age, when "the vigor of the Irish reached a level never since attained," is called the Heroic Age; among the peoples of Scandinavia and North Germany, the age is recorded thus by the *Elder Edda*, in R. B. Anderson's translation:

They altars raised  
And temples built;  
Furnaces they established,  
Precious things they forged,  
Their strength they tried  
In many ways  
When making tongs  
And forming tools.  
  
On the green they played  
In joyful mood,  
Nor knew at all  
The want of gold. . . .

Excavations in Drunkelin bog, Donegal County, Ireland, have uncovered a corded oak road and a two-story log cabin which appear to belong to this period. Fourteen feet of bog lie below the cabin floor and 26 above.

During the Bronze Age, iron was a curiosity, a sort of rare and precious metal. It came exclusively from meteorites, the early Greek word for iron being *sideros*, which came to mean "the stars." In the *Iliad* one of the prizes in the races at the funeral of Patroclus was a lump of meteoric iron. Iron objects of that period almost always show, on analysis, from 7 to 11 per cent of nickel, a definite indication of their heaven-sent origin. The common metal of that time, bronze, is a man-made alloy, and it necessitated the bringing together of copper and tin, in alluvial form, from different localities. This requirement stimulated long-distance trade contacts between distant nations, which built up large trading centers and stable agricultural districts. The Bronze Age was a cultured civilization, with peaceable trade both by land and by sea. Investigators working in France on the sites of Bronze Age settlements have recovered over 48,000 bronze axes alone, dating from this period.



H. J. Massingham:  
Downland Man  
(Jonathan Cape, Ltd.)  
A Bronze Age  
dagger



But the best of things cannot last forever. Trouble appeared in the East — in Asia Minor: About 2000 B.C. the smelting of iron ore was discovered by the Hittites, a people about whom fifty years ago nothing was known except for biblical references but of whose life and works we now know a great deal, thanks to the efforts of John Garstang. The seat of the Hittite Kingdom was in the central high plateau of Asia Minor around Tuz Göl Lake (known in ancient times as Lake Tatta), in what we now call Anatolia, or Asiatic Turkey. Baked-clay tablets discovered on the site of the capital city have given us our chief information about the Hittites. The special circumstances which were responsible for the development of iron-ore smelting have been investigated by William Gowland and were stated in 1912 in his Huxley Memorial Lecture.

In the first place, the Hittites had two important deposits of iron ore which, exposed by erosion in river valleys, were easy to get at. In the second place, the country at that time was probably well wooded, making the production of the charcoal needed for the smelting a simple matter. The most important circumstance of all, however, was the fact that these Hittites were tall, powerful men of Asiatic descent, who had originally come from the steppe country to the east and not only had the big stone hammers necessary for forging but were strong enough to wield them properly. It appears to have been a case of the right men, the suitable tools, and the needful ore and fuel all brought together at the right time. Excavations have revealed abundant evidence of that metallurgical activity.

For many centuries the Hittites held a monopoly in the manufacture of iron, products of their ironworking gradually reaching other parts of the world. Tutankhamen's tomb in Egypt, dated about 1350 B.C., contained many imported iron objects. It appears even that iron weapons occasionally reached as far as northwestern Europe, and the famous blue steel sword used by Sigmund and Sigurd in the *Volsunga Saga* and the *Nibelungenlied* was so superior to the usual softer bronze swords of the period that it was reputed to be able to pierce trees and stone.

The kingdom of the Hittites came suddenly to an end about 1200 B.C. at the hands of the Phrygians, of whom King Midas of gold-hoarding fame is the most notorious. This defeat resulted in a general exodus of the Hittite ironworkers into surrounding countries, into which they introduced their new art. One group of these refugees settled along the seacoast of Judea and became known as the Philistines. It was the superiority of the Philistines' steel weapons which enabled them for so many years to keep at bay the Hebrew tribes who lived in the hill country behind them. The ironworking art also

spread gradually westward, and the year 900 B.C. found it well established in the central Danube basin, where valuable deposits of iron ore led to the development of an Iron Age culture. Excavations in A.D. 1846 in an ancient cemetery at Hallstatt, Austria, provided such evidence of this culture that the early Iron Age in that part of Europe is called the Hallstatt period.

The climate then took a part in the drama, and at a date usually fixed at 750 B.C. (a date determined by Werner Lüdi's studies of bog growth in Switzerland and C. E. P. Brooks's studies in Ireland as well as by Ellsworth Huntington's studies of the growth of tree rings) the climate of northwestern Europe suffered an extraordinary and abrupt change. This change is described

in the Norse *Elder Edda* as the Fimbul-winter; it was the terrible winter during which, we are told by the ancient singer, snow fell from the four corners of the earth, the frosts were severe, the winds piercing, the weather tempestuous, and the sun imparted no gladness. Three such long and gruesome winters passed, the poet declares, without being tempered by a single summer. As if not enough climatic wrath had been visited upon suffering mankind even then, these were followed by three more

similar winters in which, again quoting from R. B. Anderson's translation of the *Elder Edda*:

Brothers slay brothers;  
Sisters' children  
Shed each other's blood.  
Hard is the world;  
Sensual sin grows huge.  
There are sword-ages, ax-ages;  
Shields are cleft in twain;  
Storm-ages, murder-ages;  
Till the world falls dead,  
And men no longer spare  
Or pity one another.

The heavy rainfall flooded the bogs again, stopping their cultivation; and the lakes rose and destroyed the villages built on their shores.

The peoples of the Bronze Age, who thus had been driven forth from their homes by famine, flood, and cold and by the accompanying anarchy, took refuge in the Central European and East European forests and wildernesses, where shelter from the fierce storms could be had and where life could be supported by hunting. But these bronze-equipped refugees thus came into contact and conflict with the iron-weaponed Hallstatt hordes, at whose hands they perished. In Norse our ancestors called this extermination the Ragnarok; in German, the Götterdämmerung; and in English the Twilight of the Gods. (Concluded on page 353)



Hittite sculpture — statue of a man and woman from Tell Halaf in Mesopotamia

Fogg Art Museum

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# THE INSTITUTE GAZETTE

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PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

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## Alumni Day Nears

*Conference and Exhibit Will Make Clear How News and Views Are Gathered and Developed; Banquet Will Honor Dr. Compton*

HOW news and views are assembled and sped by various channels throughout the world will be analyzed by able speakers and will be demonstrated in comprehensive exhibits for M.I.T. men and their families and guests on Alumni Day, June 3. After registration from eight-thirty to ten o'clock in the morning, the communications conference on "Channels of World News and Opinion" will be opened in Huntington Hall (formerly Room 10-250) with Frank B. Jewett, '03, President of the Alumni Association and of the Bell Telephone Laboratories, and Vice-President of the American Telephone and Telegraph Company, as presiding officer. President Jewett will introduce as speakers Alfred H. Morton of the National Broadcasting Company, who will discuss "The Role of Radio in World Affairs," and James H. Furay of the United Press Associations, whose subject is "Behind Scenes in the World of News Gathering."

Now Vice-President in charge of television for the National Broadcasting Company, Mr. Morton was European manager for the Radio Corporation of America from 1929 to 1934, served as manager of the program department of the National Broadcasting Company from 1934 to 1937, and came to his present post from that of vice-president in charge of stations managed and operated by N.B.C., which position he had held from 1937 to 1939. He thus will speak of radio in world affairs in the light of broad experience which has dealt greatly with the international phases of radio administration.

A member of the Association of Foreign Press Correspondents, Mr. Furay has had similarly extensive experience in the field of news gathering, with especial acquaintance with foreign affairs. Foreign editor of the United Press Associations from 1918 to 1924, he has been a member of the organization since 1908, was general foreign manager

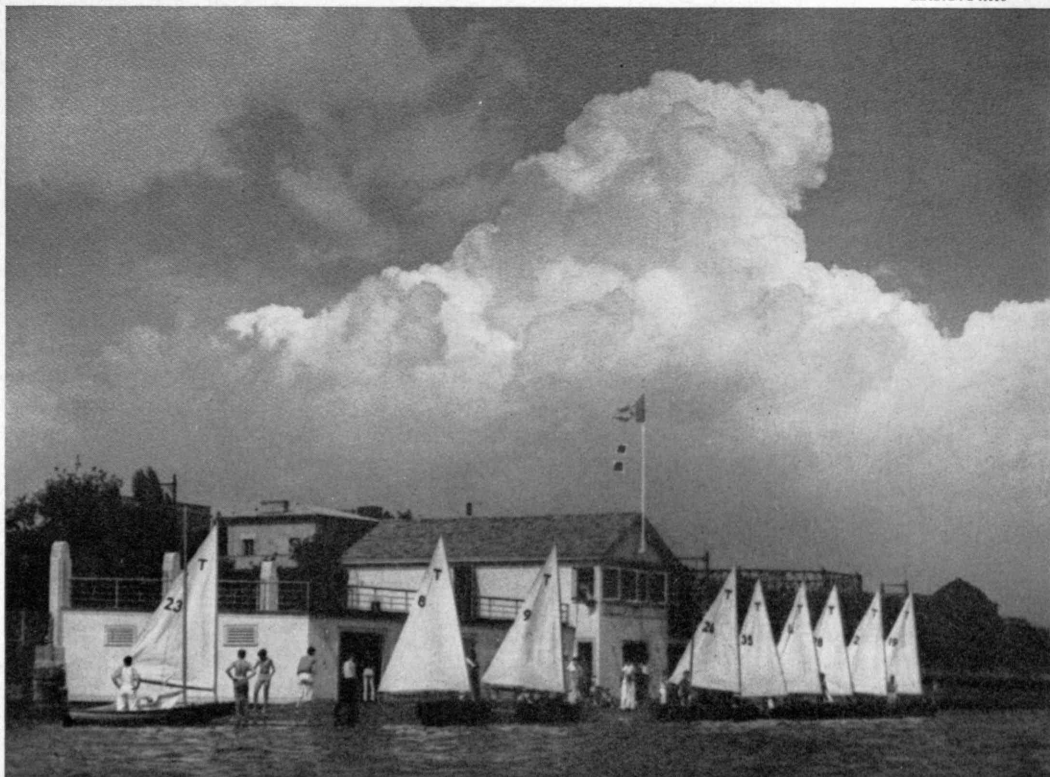
from 1924 to 1937, and since 1937 has been its vice-president. He has thus been himself behind the scenes in the world of news gathering which he will discuss.

Complementing these addresses, extensive exhibits in both the Main and Rogers lobbies will show scientific progress in the transmission of information by wire and radio, offering Alumni an unusual opportunity to learn at first hand the rapid development of the field of communications. The exhibits will include a teletype receiving up-to-the-minute press-association dispatches, a teletypesetter for setting type by wire, a picture transmitter, a ship-to-shore radio transmitter and receiver with radio compass, an aviation radio receiver and transmitter, as well as others. Thus it will be possible to inspect and to see in operation representative devices of the kind essential to the work which the conference speakers are to discuss.

Luncheon in Du Pont Court will open the afternoon's activities, being served at twelve-thirty, and there will be special tables for the classes of 1890 and 1915, this year respectively celebrating their fiftieth and twenty-fifth reunions. Class Day exercises at two o'clock in Lowell Court will find these classes sharing honors with the Senior Class, that of 1940, who will be formally initiated to membership in the Alumni Association during the Class Day ceremonies. The schedule of class reunion programs appears on page 332.

Technology's new swimming pool, made possible by alumni, staff, and student endeavor, will be dedicated at four-fifteen in the afternoon, these ceremonies being the last pre-evening event. At six-thirty, at the Statler,

M.I.T. Photo



*A section of Technology's nationally noted dinghy fleet*



### *Class Reunions Summarized*

Practically all the classes planning their quinquennial forgatherings have already completed arrangements for their reunions, and, with one exception, these are all scheduled for the week end immediately preceding Alumni Day (Monday, June 3).

- 1885 — 55th reunion, luncheon tentatively scheduled for June 22, The Country Club, Brookline, Mass.
- 1890 — 50th reunion, Hotel Marblehead, Marblehead, Mass., June 1 and 2. Special places reserved for luncheon on Alumni Day and at the Class Day exercises in the afternoon. The Class will participate in graduation exercises on June 4.
- 1895 — 45th reunion, New Ocean House, Swampscott, Mass., June 1 and 2.
- 1900 — 40th reunion, East Bay Lodge, Osterville, Mass., June 1 and 2.
- 1905 — 35th reunion, Boxwood Manor, Old Lyme, Conn., May 31, June 1, and June 2.
- 1910 — 30th reunion, class banquet at University Club, 40 Trinity Place, Boston, May 31; outing at Toy Town Tavern, Winchendon, Mass., June 1 and 2, with special events for the ladies.
- 1915 — 25th reunion, Oyster Harbors Club, Osterville, Mass., May 31, June 1, and June 2.
- 1920 — 20th reunion, Sheldon House, Pine Orchard, Conn., May 31, June 1, and June 2.
- 1925 — 15th reunion, Corinthian Yacht Club, Marblehead, Mass., June 1 and 2.
- 1930 — 10th reunion, Riversea Inn, Old Saybrook, Conn., June 1 and 2.
- 1935 — 5th reunion, Mayflower Hotel, Plymouth, Mass., June 1 and 2.

Although they will not be celebrating five-year milestones, the following classes are among those which have scheduled more or less informal get-togethers:

- 1888 — "Twelfth Webster Class Dinner," 307 Hammond Street, Chestnut Hill, Mass., 5:30 P.M., June 2.
- 1897 — Colonial Inn, Concord, Mass., June 1 and 2.
- 1899 — Essex County Club, Manchester, Mass., June 1 and 2.
- 1904 — Boxwood Manor, Old Lyme, Conn., June 21, 22, and 23.
- 1907 — Hotel Statler, Boston, Mass., 5:00 P.M., June 3.
- 1922 — Headquarters, Hotel Kenmore, Boston. Make reservations through C. Y. Chittick, 77 Franklin Street, Boston.

the annual Alumni Day banquet, this year honoring the tenth anniversary of Dr. Compton's inauguration as president of the Institute, will bring Alumni Day 1940 to a brilliant close. Dr. Jewett will be heard again, this time as he sketches the highlights at Technology since Dr. Compton became its president. Dr. Compton himself will make his interesting annual report on the Institute. A demonstration in sound, the "Vocoder," will be presented by its inventor, Homer Dudley.

As in past years, a special program of events for the ladies has been arranged, paralleling that for the men in many respects and including open house in the Forris Jewett Moore Room (Room 6-321) in the Eastman Building from three forty-five to four forty-five in the afternoon; motorboat trips on the Charles at five; and dinner at the home of President and Mrs. Compton, 111 Charles River Road, at six-thirty, with busses to the Hotel Statler for the program following the men's dinner.

President Compton will be host to the Honorary Secretaries, officers of Technology clubs, and Alumni Fund agents at the annual supper at the Engineers Club, 2 Commonwealth Avenue, at six-thirty on the evening of

Sunday, June 2. The baccalaureate sermon to the Class of 1940 will be delivered in Walker Memorial at three o'clock that afternoon by James B. Conant, President of Harvard University. Commencement Day, June 4, will see the graduation exercises at eleven o'clock in Symphony Hall, with Henning W. Prentis, Jr., President of the National Association of Manufacturers, as speaker. From two to four o'clock that afternoon the laboratories of the Institute will be open for inspection. The President's reception to the graduates of 1940, their parents, and Alumni in Everett Morss Hall (formerly Main Hall) of Walker Memorial from four to six will conclude the festivities attendant upon the end of another academic year in Technology's history.

### *Sloan Fellowships*

**E**LEVEN young executives nominated by industries in all parts of the country have been awarded Alfred P. Sloan Foundation fellowships for special one-year programs of advanced study in economics and administration starting at the Institute this month. Two hundred and seventy-nine companies have entered candidates in the annual Sloan fellowship competitions, of which this was the third.

The successful candidates this year are Donald L. Boyes, assistant production manager, Saginaw malleable iron division, General Motors Corporation; Andrew E. Burnett, district engineer, Alabama Power Company; Paul C. Dunn, '34, traveling inspector, Boston and Maine Railroad; William L. Fader, Jr., supervisor, Pittsburgh Forgings Company; Walter D. Howell, industrial power sales division, Pacific Gas and Electric Company; Gaynor H. Langsdorf, '32, superintendent, hydrogenation plant, Standard Oil Company of California; David D. Moffat, Jr., division sales engineer, Utah Power and Light Company; Thomas Waaland, assistant to the director of pasteurizing plants, Sheffield Farms Company, Inc.; Arthur W. Weber, assistant manager, Wellsboro plant, Corning Glass Works; John F. Wilson, supervisor, Hygrade Sylvania Corporation; and George E. Yeomans, Eastman Kodak Company. The members of the group have an average of more than eight years of industrial experience since the completion of their education. Each will receive a stipend of \$2,500.

Commenting on the awards, President Compton said: "The economic and social problems of today are numerous and complex, and require for their effective solution the co-operation of industry, labor, and government. To assume its proper share, industry must study intensively our economic and social ailments and the causes underlying them. New and enlarged concepts of the functions and responsibilities of industry are in the making. Old concepts found inadequate by experience are in the process of being discarded. The leaders of business, and all in business, must share in the development of the new ideas or perhaps have less valid concepts forced upon them by those outside industry who may little understand industry's problems. Leaders capable of meeting the new range of problems and deserving of public confidence in ability to share in their solution must be trained to carry on. The young men

to whom these awards have been given have proven ability and demonstrated awareness of the problems to be faced. They seek, through these fellowships, to increase their understanding for the task ahead."

A long list of business leaders, government officials, and representatives of labor will share the responsibility of giving to the Sloan Fellows a fundamental understanding of business and of the responsibility of industry to society. This aspect of the program will be in addition to seminar study, individual investigation, and group visits to industrial plants.

The fellowship program, which is directed by Professor Wyman P. Fiske, is under the general supervision of a distinguished advisory committee composed of Frank Aydelotte, President of Swarthmore College and Secretary of the Rhodes Scholarship Committee; President Compton; the Rev. C. Leslie Glenn, rector of Christ Church, Cambridge; A. Lawrence Lowell, President emeritus of Harvard University; and Edmund C. Mayo, President, Gorham Manufacturing Company.

### Council Conclaves

**I**NCREASE of interest and activity among Alumni was remarked upon by President Compton when he told the April meeting of the Alumni Council about his recent visits to western Technology clubs during a trip to the Pacific Coast. His description of the trip and of some of the latest developments at the Institute opened the Council's regular meeting — its 213th — on the last Monday of the month. Presiding was Raymond Stevens, '17, Vice-President of the Alumni Association. After reports from Francis A. Barrett, '24, chairman of Alumni Day; Charles E. Locke, '96, Association Secretary; Arthur L. Townsend, '13, chairman of the Committee on Nominations for Advisory Councils; and Samuel C. Prescott, '94, chairman of the Committee on Annual Awards of Recognition, Mr. Stevens presented as speaker of the evening Edward R. Schwarz, '23, Professor of Textile Technology at the Institute, whose subject was "Textiles in the Light of Modern Science."

Stressing that only after thousands of years of usage has man begun to study the ultimate structure of the important silk, wool, flax, and cotton fibers, Professor Schwarz declared that the important development in textile technology is the realization that physicists, chemists, biologists, botanists, and mathematicians must join in the study of the architecture of natural and synthetic fibers. Between the scientific investigator and the manufacturer stands the textile technologist, whose work may be described as rendering usable and understandable the information coming from the laboratory as he comprehends it in the light of the problems of the textile industry. To function efficiently, he must have the ability to translate the language of science into that of the millman. He must hence be trained, must be continuously supplied with facts by research, and must have a sympathetic hearing by the manufacturer. Professor Schwarz's talk covered many studies that are going on at Technology.

Recent balloting for members of the National Nominating Committee resulted in the election of Charles R. Main, '09, for District 1; Stanley W. Hyde, '17, District 2; Kenneth M. Cunningham, '22, District 4; and Charles P. Fiske, '14, District 5. As class representatives on the Alumni Council, re-elected were William P. Atwood for '76, Godfrey L. Cabot, '81, Arthur G. Robbins, '86, Salmon W. Wilder, '91, John A. Rockwell, '96, Willard W. Dow, '01, Edward B. Rowe, '06, Orville B. Denison, '11, Henry B. Shepard, '16, Henry R. Kurth, '21, Eben B. Haskell, '26, Gilbert M. Roddy, '31, and Robert E. Sawyer, '36. Malcolm G. Wight, '06, newly elected representative for the Technology Club of Hartford, and John F. Ancona, '03, class representative at large on the Council and Honorary Secretary for Rochester, were present at the meeting and were introduced. Elections to Advisory Councils were those of John A. Rockwell, '96, chairman, Athletics; Harold Bugbee, '20, and F. Alexander Magoun, '18, Musical Clubs; Frederick G. Fassett, Jr., staff, and Stanley G. H. Fitch, '00, Undergraduate Publications; and Harry J. Carlson, '92, Walker Memorial.

*In the cyclotron laboratory of 1939 Nobel Prize winner Ernest O. Lawrence at the University of California in Berkeley on March 28, shortly before announcement of the Rockefeller Foundation's appropriation of \$1,150,000 to assist Professor Lawrence in the construction of a super-cyclotron. After the meeting pictured here, most of the group spent the week end at Del Monte Lodge to discuss cyclotrons and ultrashort-wave radio. In the adjacent photograph are, left to right, Dr. Lawrence; Arthur H. Compton, 1927 Nobel Prizeman and Professor of Physics at the University of Chicago; Vannevar Bush, '16, President of the Carnegie Institution of Washington; James B. Conant, President of Harvard University; Karl T. Compton, President of M.I.T.; and Alfred L. Loomis of the Loomis Laboratories, banker-physicist and life member of the Institute's Corporation.*





The 212th meeting of the Alumni Council had been held jointly with the Institute Faculty Club on the last Monday in March. Wat Tyler Cluverius, Rear Admiral, United States Navy, retired, who came to the presidency of Worcester Polytechnic Institute last year, was the speaker of the evening, discussing "A New Experience in Education." Ernest D. Wilson, '14, Frank C. Howard, '17, Kenneth G. Merriam, '22, John P. Vinti, '27, Albert D. King, '32, and John M. Petrie, '32, Institute Alumni now teaching at W. P. I., were guests of the club and Council. Professor Carle R. Hayward, '04, President of the Faculty Club, opened the meeting, subsequently turning its conduct over to Mr. Stevens.

Commenting on contrasts between life in an institution such as W.P.I. and life in the Navy, Admiral Cluverius pointed out that in matters of discipline and ambition, as well as in purpose and incentive, the two are closely related. The training given by engineering schools, he held, is the best adapted to developing men well fitted to enter into world competition; to this training, contributions are made by athletics and fraternity life, as they encourage the mingling of men from various institutions. The gathering together in colleges of students from widely separated parts of the country is similarly valuable, Admiral Cluverius maintained, through its fostering of understanding. Since public relations are coming to be of greater and greater importance in a man's education, anything that schools can do to prepare young men for them deserves encouragement. The problem of W.P.I. and similar schools is how to go on progressively, adjusting their programs to meet changing conditions and new needs as they arise.

### Credit to the Crews

TECHNOLOGY crews, under new head coach Robert G. Moch, new freshman coach James B. McMillin — both members of the 1936 University of Washington Olympic crew — and veteran Patrick B. Manning, have made remarkable showings this spring. In the first race of the year, the Rowe Memorial Regatta on April 27, all M.I.T. crews — varsity, junior varsity, freshman, and 150 pound — lost very close races to Harvard. In every race except the varsity, Harvard won

by less than a full length, and in the varsity race, Technology was defeated by  $1\frac{3}{4}$  lengths and edged by Syracuse by less than a boat deck.

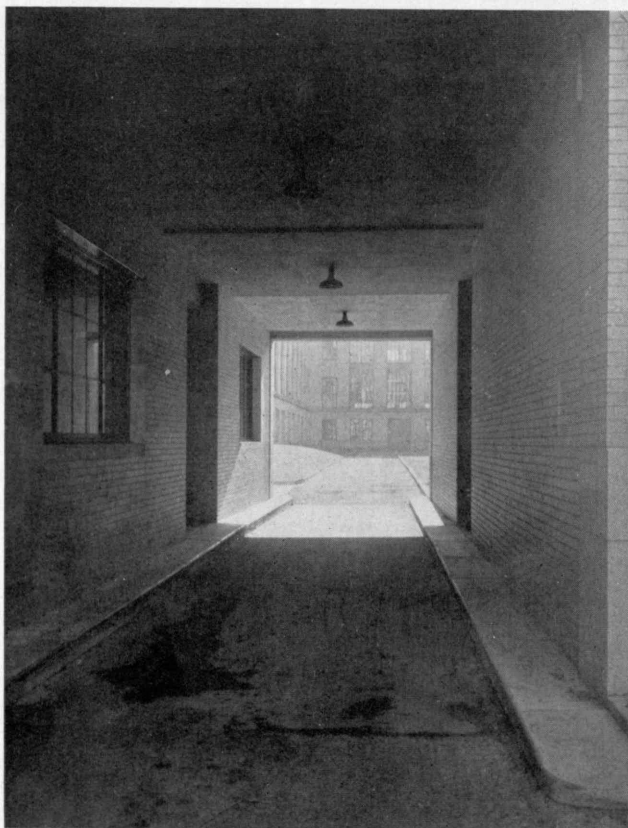
At Princeton, on the following Saturday, all four Technology crews defeated Princeton, losing to Harvard in the varsity and junior varsity races by  $1\frac{3}{4}$  lengths and one length, respectively. At Derby, Conn., on May 11, Technology's freshman crew defeated both Yale and Syracuse. The junior varsity was third in its race, while the varsity defeated Syracuse and was less than three-quarters of a length behind Yale. Not since 1936 have the Harvard and Yale first crews been defeated in sprint

races of less than two miles. In view of this fact, the Technology showing can be considered most creditable. Messrs. Moch and McMillin were named to the Institute coaching staff last summer. News writers of the East have acclaimed them and Mr. Manning for the fine showing of the Technology navy.

### New Shell Named

IN recognition of his efforts in promoting the use of the Charles River Basin for water sports, the new shell presented to the crew by the Institute Committee has been named for Eugene C. Hultman, '96, chairman of the Metropolitan District Commission of Boston. The christening was performed by President Compton in the presence of Mr. Hultman, members of the Advisory Council on Athletics, the coaches, and members of the various Technology crews, which have made such a fine showing in their races this spring, as the summary immediately above indicates.

Since Mr. Hultman has been chairman of the Metropolitan District Commission, rowing and sailing on the Charles River Basin by public and college groups have been given encouragement. In addition to the activities of the M.I.T. Nautical Association, with its pavilion and fleet of forty dinghies, sailing activities for underprivileged boys of Boston have been organized by community groups, and facilities for both powerboating and sailing have been provided for other groups. Model-yacht sailing, now an international sport, has been encouraged by provision of a special lagoon and a building for storage of the models. In winter these facilities are kept active as well, being used by crowds of skaters.



M.I.T. Photo

*Appropriately enough, the sunny end of this passageway under the wing connecting the Rogers Building and the earlier part of the Institute's main educational plant debouches on the erstwhile entrance familiar to many Alumni as "69."*

## Graduation Broadcast

**A**LUMNI will have opportunity to hear the Institute's commencement exercises by either short-wave or long-wave broadcast. Professor Ralph G. Hudson, '07, chairman of the Committee on Commencement, has announced that on June 4, from 11:00 A.M. to 1:00 P.M., eastern daylight-saving time, Station WRUL of the World Wide Broadcasting Foundation in Boston will broadcast the entire program, including the commencement address by Henning W. Prentis, Jr., President of the National Association of Manufacturers, and Dr. Compton's message to the graduates. The broadcast will be on 15.25 megacycles (19.6 meters) and on 11.79 megacycles (25.4 meters). Listeners more than 200 miles from the vicinity of Boston will find the 15.25 megacycle band better for long-distance reception.

Station WMEX, transmitting from Boston on 1,500 kilocycles, will present a regional broadcast of the first hour of the graduation exercises, during which the commencement address will be delivered.

## Visiting Committee Reports

**T**WO more in the series of Visiting Committee reports, abstracts of which appear at intervals in The Review, are presented below.

### DEPARTMENT OF MECHANICAL ENGINEERING \*

**A**T the Committee's annual meeting, Dr. Hunsaker, '12, reported the expansion of the postgraduate enrollment, which now numbers eighty-three students, exclusive of fourteen special graduate students in

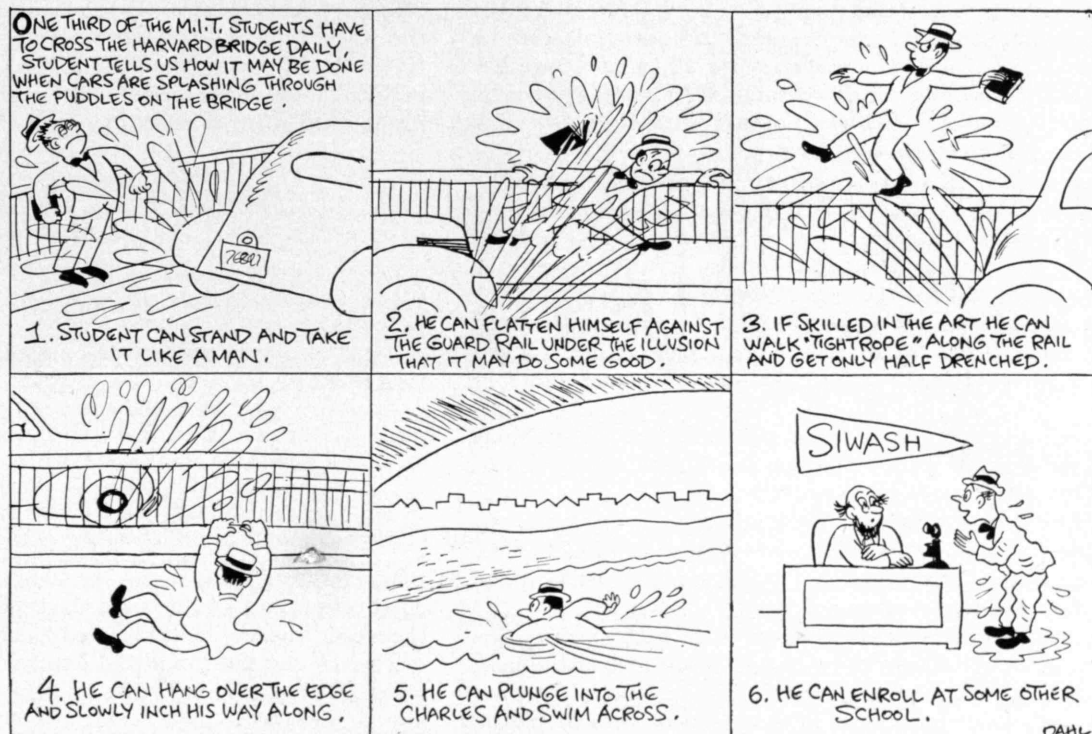
\* Members of this Committee for 1939-1940 are Ralph E. Flanders, Chairman, William R. Kales, '92, B. Edwin Hutchinson, '09, John Homan, '15, George J. Mead, '16, Samuel W. Dudley, and R. C. Muir.

Marine Engineering. It is possible to expand the regular number to one hundred. Dr. Hunsaker also reported the new arrangement for honor students, which permits a five-year course with a broader and better-balanced curriculum and with the tuition paid for the last year. This applies to students with records of 4.0 or better. The nine students who have qualified this year constitute about 10 per cent of the Class. If this number should increase, additional scholarships will be needed.

Dr. Compton proposed, and the Committee heartily seconded, an addition to the automotive laboratory. The pressure on the drafting room of the Department of Aeronautical Engineering is becoming so great that the space now used for the automotive drafting room is needed. Meanwhile, the pressure of work in the automotive drafting room itself is increasing, and space in the automotive laboratory is at a premium. These deficiencies could all be met by building an addition to the automotive laboratory, the cost of which would be about \$100,000. The lower floor would be devoted to the stock room and to engine storage and display, leaving the laboratory itself free for the installation of additional test engines and an expanding student body. The second floor of the addition would house the automotive engine drafting room, which would thus be immediately adjacent to its laboratory instead of a considerable distance removed from it as at present. The Committee heartily approve of this project, recommend it to the Corporation, and feel hopeful that a donor may be found for the structure.

The Committee further recommend that the Corporation appropriate the sum necessary to purchase a modern precision testing machine for the Testing Materials Laboratory. The one formerly in use for student work is employed on a long-time research. [This appropriation has been voted.] (Continued on page 353)

Thus does Francis Dahl, the Boston Herald's pictorial commentator upon life as she is lived, record a familiar springtime recollection.





## RELIGION IN A SCIENTIFIC ERA

(Concluded from page 320)

to the conception of a great spiritual force operating through natural laws which are understandable and dependable and at least partly discoverable through science. We see the picture of a continual development in ideas of right and wrong, from the early notions of obedience to sets of rules to concepts of social justice and human welfare. We see notions of salvation and eternal life becoming less concentrated on selfish considerations and more concerned with service to others and the permanent contribution of our individual lives to the future welfare of mankind. This dynamic concept of religion as a continually evolving and developing spiritual force is inspiring and acceptable in a scientific world. In my judgment the static concept of religion is sterile, discouraging, and unacceptable.

I believe there is justification, and even need, for a variety of religious denominations which emphasize different aspects of that complex thing that we call the spiritual life. There are two reasons for this belief. The first is that there are many different types of persons: Some are emotional, others are severely analytical; some are philosophical, others are active; some like to take initiative and responsibility, others like to be led and directed. So it is natural that there should be churches or other religious organizations where each person can find that type of fellowship and opportunity for expression and activity which will give him the best spiritual satisfaction and development.

A second advantage in having some diversity in religious organizations is that a certain amount of diversity makes for virility and progress. This appears to be true in all aspects of life. It is the diversity of plant life that maintains such life despite diseases and pests which attack and perhaps destroy one or another type. Existence of different types of social organization gives the experience on which sound improvements can be made. In general the tendency for all to herd together makes for safety, conservatism, and stagnation, whereas the tendency for expression of individuality leads to risk and progress, though at the expense of some confusion. I suspect that this truth holds in religion as in other aspects of life. So, on both counts, I do not agree with some who wish that all religions and churches might combine.

A corollary to this last point of view is the need for tolerance and mutual respect between different religious groups. The basis for such tolerance is found in the essential similarity of what I would call the basic objectives and attitudes of all religions. They may differ in emphasis on various points, they may even hold contradictory views on some matters, but all religions worthy of the name possess common ideals of goodness, of unselfishness and service, of reverence for a power which transcends our human strength and understanding. The work of the National Conference of Catholics, Jews, and Protestants is a fine example of enlightened effort to stand together for such essentials.

In recognizing that religion deals with spiritual interests and values, while science is supreme in the field of observable facts and logical relationships, it is proper to remember that, even in the realm of nature, science

has its limitations which are not always appreciated. Science never discovered the ultimate origin or purpose of anything. It can find out *how* the universe works, *not* what caused it or what determines the way it works or its *purpose* or its ultimate destiny. If any religion wishes to include a speculation regarding these matters, science cannot gainsay her — for these are outside the realm of science. But, in my judgment, they are also outside the proper realm of religion and, being probably incapable of any proof by observation or deduction, are left only to imaginative speculation.

In conclusion, if I were to try to describe the position of religion in a scientific world, I should summarize the situation about as follows: The entire history of the contact of religion and science shows that the facts of the world and of life which are capable of observation and test, constitute a realm in which science is supreme. Science has not supplanted and cannot supplant or destroy religion in the proper sense. It can, however, give a setting to which our thoughts on religious matters must conform. Science has continually forced men to take an ever wider and grander concept of religion by breaking down artificial barriers of ignorance and superstition. Its whole tendency has been to emphasize the fundamentally spiritual character of religion as representing the highest ideals and aspirations of mankind as opposed to theological rules, doctrines, theories, and so on. Science has therefore had tremendous influence in shifting the emphasis of religion from the physical to the spiritual world, and we must not shut our eyes to the possibility of still further powerful influence of this sort.

Science has thus helped to make religion into a developing, dynamic spiritual force. I believe that the principal influence of science upon religion has been along the following lines: first, to break down "authority" and substitute reason based upon facts of observation; second, to eliminate superstition and chicanery from religion; third, to doom any religion of the static type and emphasize the necessity for a continual development of religious thought to keep pace with and interpret the increasing knowledge regarding all matters which pertain to man's activities and environment.

## CIPHER FOR SECRETS

(Continued from page 322)

He therefore sits down and writes the following innocent-looking letter to X4:

8/8/39

Dear Frank,

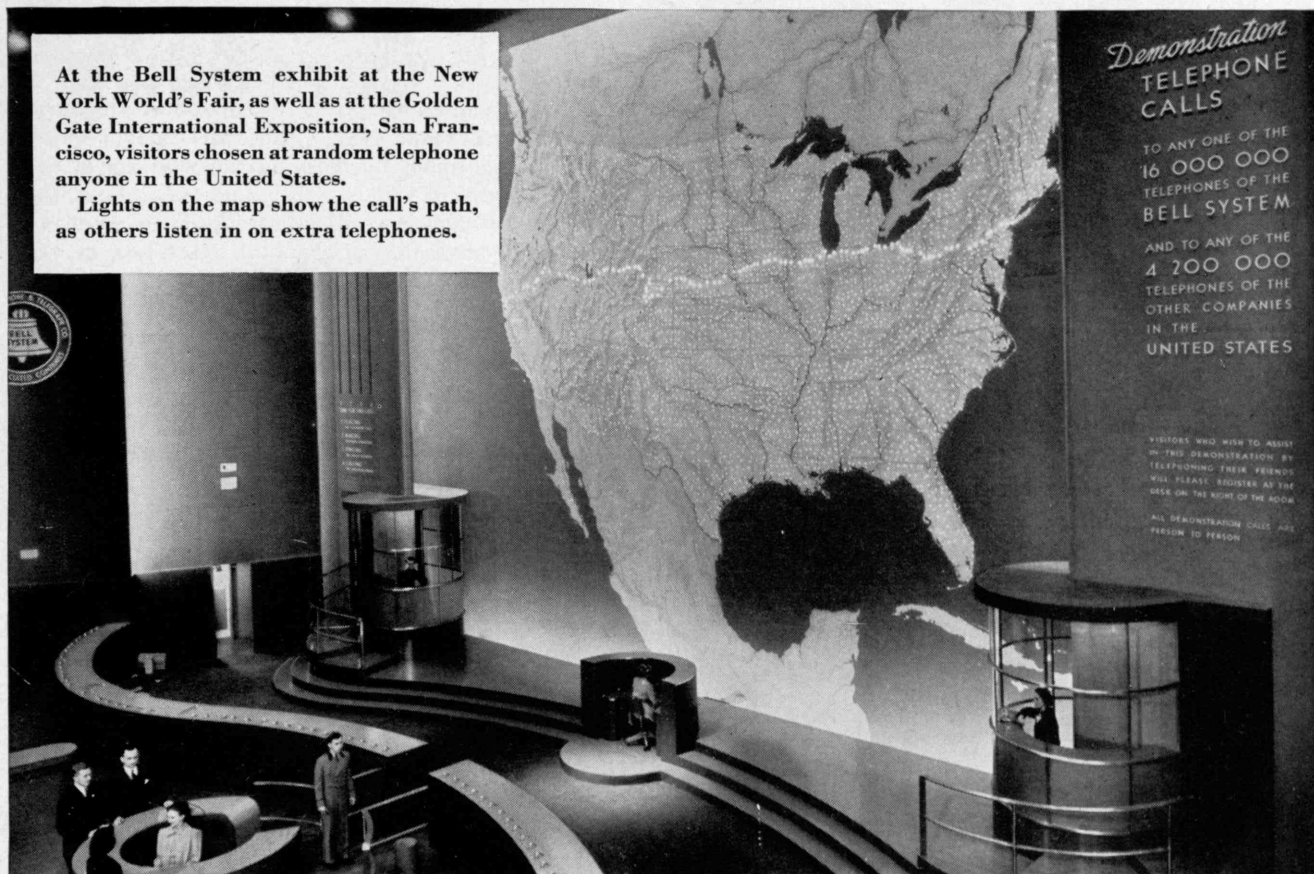
Thanks for your letter and enclosed photo which you can surely guess was received with a great deal of pleasure by all of us and especially Ma, to whom it means so much. You certainly have changed in the last few months, but no doubt to Ma you are still the same young kid, mustache or no mustache. Glad to hear that things are moving your way and I hope you will realize hte importance of. . . .

That is as far as X4 reads, for the typing error following the word "realize" tells him that the rest is mere filling.

The date at the top of the letter is the first thing at which X4 looks. It tells him two things: first, that the key word of the cipher is "eight" (Continued on page 338)

At the Bell System exhibit at the New York World's Fair, as well as at the Golden Gate International Exposition, San Francisco, visitors chosen at random telephone anyone in the United States.

Lights on the map show the call's path, as others listen in on extra telephones.



Maybe YOUR voice was amplified  
*a billion, billion, billion times . . .*

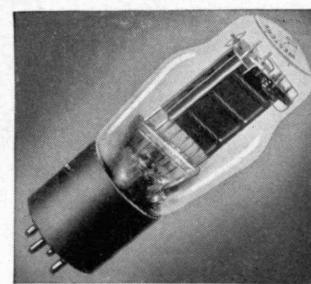


Were you one of the lucky ones? Then the volume of your voice was amplified millions, perhaps billions of times, depending on the distance you talked.

As the diagram shows, the voice fades, and again and again has to be given renewed power in order to reach its destina-

tion with all its original clarity and force.

In repeater stations located about every 50 miles, intricate apparatus developed by Bell Telephone Laboratories and produced by Western Electric, performs this wonder—the faithful transmission of speech.



The heart of this amplifying system is the vacuum tube, and Western Electric pioneered in making these "Aladdin's lamps of communication." They have made possible long distance telephony, radio and indeed the whole range of modern communication — a striking example of the value to the public of the American way of doing things.

**Western Electric**

... made your  
**BELL TELEPHONE**





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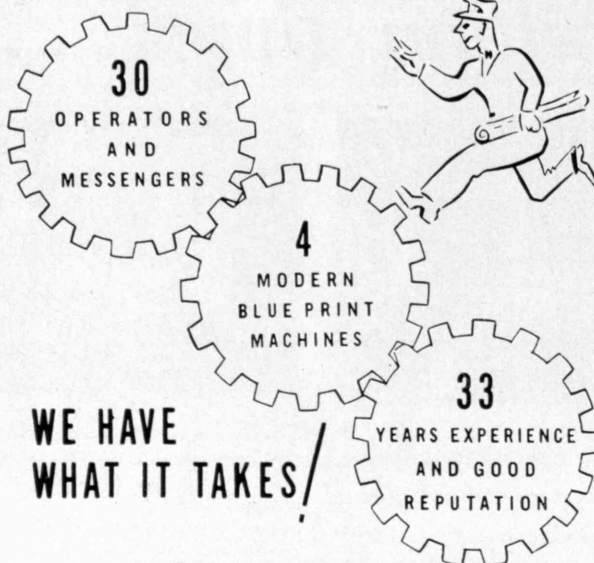


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Our extra quality sash cord, distinguished at a glance by our trade-mark, the colored spots. Especially well known as the most durable material for hanging windows, for which use it has been specified by architects for more than forty-five years.

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A. L. Well '01

## CIPHER FOR SECRETS

(Continued from page 336)

(for the key is chosen according to the date on which the message was sent) and, second, that the cipher message itself will be disclosed by dividing the wording of the letter into groups of 8, 8, 3, and 9, and then extracting the first letter of each word thus grouped. So, counting eight words from the beginning of the letter, he comes to the word "enclosed" and notes down the letter *e*; eight words from "enclosed" he comes to "received" and writes down the letter *r*; three words from "received" brings him to "great," and he jots down the letter *g*; and so on. Count the message throughout according to this key, and you will be able to write out, as X4 has done, the original cipher message, which, for purposes of decipherment, must be keyed again:

e r g e y m d k t h r  
E I G H T E I G H T E

To decipher it, X4 takes each key letter, follows it horizontally along his table until he comes to the corresponding cipher, then moves upward vertically and finds the actual text letter in the top line of capitals. Thus, *E* (key letter) followed horizontally to *e* (cipher letter) discloses *A* as the text letter; *I* (key letter) followed horizontally to *r* (cipher letter) discloses *J* as the text letter. Take an exercise in decipherment for yourself, and you will, or should, check as follows:

e r g e y m d k t h r (Cipher)  
E I G H T E I G H T E (Key)  
A J A X F I V E M O N (Text)

You may wonder why M3 went to all the trouble of ciphering his message when he might have hidden the straight text in a letter, in the same way that he covered the cipher. The answer is that any secret-service operative worth his salt is alert to such an old trick; if the letter had been opened, it would, after being tested for secret inks, have been grouped according to the date, just on the chance of a disclosure.

The beauty of cipher, as compared with its more prosaic relative, code, is its elasticity, and, in consequence, the many methods by which its use may be fitted to circumstantial needs. The secret agent with a single system, however, would be quickly hamstrung; scores of variations on the cipher theme are part and parcel of a competent spy's equipment.

Let us, for example, presume that X4, having received M3's communication, has now to pass it on to another agent, C5, but has strict instructions not to be in direct contact with C5 either by letter, telephone, signal, or even through a third party. One way of tackling the job would be to borrow a leaf from the secret-service archives of the World War and imitate a case which, if it were fiction instead of fact, might have been filed as "The Case of the Man Who Sang in His Bathtub." It happened in Stockholm, where an agent suspected by the Allied secret-service operatives was being shadowed night and day. In spite of the fact that they never let him out of their sight, tapped his phone calls, and opened both his incoming and outgoing mail, not a shred of evidence could they find to (Continued on page 340)

# MINE TO MARKET

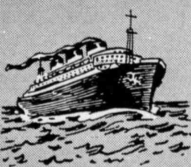
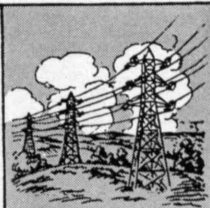
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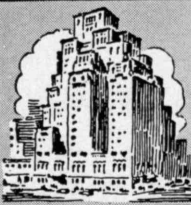
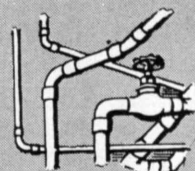
### AMERICAN COPPER PRODUCTS DIVISION

manufacturers of copper rods, wire, strip, bus bars, copper ground rods and special shapes, strand, trolley wires, brass and bronze wire and strip, weatherproof wire and P.D.C.P. hollow cables.



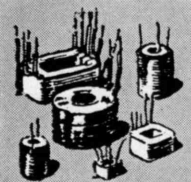
### BRITISH AMERICAN TUBE DIVISION

manufacturers of "Bulldog" condenser and heat exchanger tubes, brass, bronze and copper tubes, copper and brass pipe, copper water tubes, oil-burner tubes, brass and bronze rods, and extruded shapes.



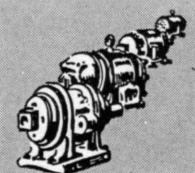
### HABIRSHAW CABLE & WIRE DIVISION

manufacturers of paper, varnished cambric and asbestos insulated power cables; oil-filled and pressure cables; telephone, telegraph and signal wires; rubber and lead covered cables; also, Habirshaw "Flame Stop" rubber covered wires and cables.



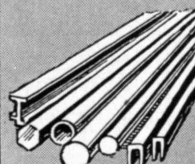
### INCA MANUFACTURING DIVISION

manufacturers of enameled copper wire, enameled fabric covered copper wire, single and double cotton or silk covered copper wire, single and double cotton or paper covered rectangular and square copper wire, glass insulated wire and coils.



### P-M-G METAL DIVISION

manufacturers of copper alloy products, having special corrosion resistance and high physical qualities; rods, bars, wire, tubing and fittings, strip, sheet, rigid conduit, electric metallic tubing, sand castings, forgings and extruded shapes.



## PHELPS DODGE COPPER PRODUCTS CORPORATION

General Sales Offices: 40 WALL STREET, NEW YORK, N. Y.

Mills: BAYWAY, N. J. YONKERS, N. Y. FORT WAYNE, IND. LOS ANGELES, CAL.



## CIPHER FOR SECRETS

(Continued from page 338)

justify any drastic action. All that they could definitely hang on him was an irritating habit of singing vociferously before an open window as he took his morning shower. Even that, however, seemed innocent enough, for his singing was confined to a sort of nondescript gibberish — peculiar, the world over, to bathroom tenors — in which no words were distinguishable. Yet it was this very gibberish that eventually gave him away, but in view of the fact that the method of communication is not easily discerned, X4 might try it as a means of passing his message to C5.

The tune to which the cipher is sung is unimportant, for all that concerns the recipient is the apparent gibberish that is made to serve for words. In these days, with home record-making outfits on the market, the recipient's task could be simplified by recording the voice of the sender, but if direct transcription were made, the singer would probably have to repeat his theme until successful reception was intimated by a request from an apparently annoyed neighbor to "put a sock in it."

Here is what C5 would have on paper when his transcription was completed:

dododaydidododumdeedaydeedododideedaydaydee  
dodeedidodumdidaydaydumdaydaydodeedidideedodo  
daydumdaydumdaydumdaydum

To decipher it, he would first split the transcription into pairs of monosyllables, disregarding the last three as being indicative of the finish of the message:

do do/ day di/ do do/ dum dee/ day dee/ do do/ di do/  
dee day/ day dee/ do dee/ di do/ dum di/ day day/  
dum day/ day do/ dee di/ di dee/ do do/ day dum

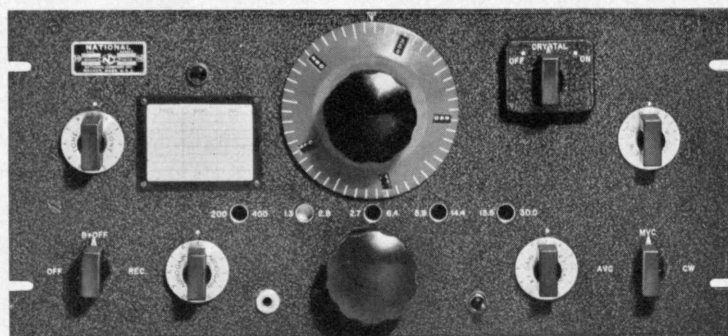
This is now deciphered by a key that, for this message, would run as follows, the left-hand column containing the first monosyllable of the pair, and the top row representing the second:

	dum	dee	do	di	day
day	Y	S	O	J	E
di	H	D	I	C	B
do	P	F	A	K	G
dee	Q	R	W	N	L
dum	T	X	U	V	M

Since this scheme is suitable only to a 25-letter alphabet, a seldom-used letter — in this message, Z — is omitted. Decipherment, as will be seen, is simple, each letter of the original message being found at the point where the appropriate row cuts the appropriate column; thus:

do do/day di/do do/dum dee/day dee/do do/di do/dee day/  
A J A X / S A I L  
day dee/do dee/di do/dum di/day day/dum day/ day do/dee di/  
S / F I V E / M O N  
di dee/do do/day dum  
D A Y

The actual cipher words are, of course, unimportant and might just as well be ti-tiddle-tee-tum-too or any other combination of five sounds that suit bathroom operatics. This particular (Concluded on page 342)



## CRYSTAL-CONTROL PLUS WIDE RANGE TUNING



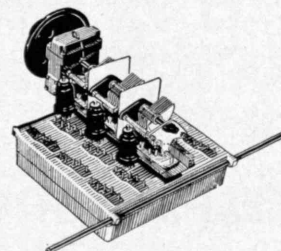
The New  
**RCE-X**  
RECEIVER

The versatile RCE-X receiver combines fixed-frequency operation with wide-range tuning. Basically the receiver is a high performance superheterodyne covering from 200 to 400 KC in one range and from 1.3 to 28.0 MC in four ranges. At the turn of a switch, the HF oscillator may be brought under crystal control, giving high stability. Two crystals are provided in a special holder which plugs into the front panel. When crystal-controlled, the main tuning condenser serves to peak the RF stages, and its setting does not affect the crystal frequency. Likewise, with the switch set for wide range tuning, the crystal does not affect the performance of the receiver.

The RCE-X is a high grade instrument in every sense. Typical of its high quality construction is the use of a large

cast aluminum shield in the base of the receiver with a separate shielded pocket for each of the RF and oscillator coils. This shield moves bodily on a track when ranges are changed, bringing the desired coils directly below the tuning condenser and tubes, thus providing the shortest possible leads. Other details include a precision geared condenser, micrometer dial, carrier-off noise suppressor, amplified and delayed AVC and beat oscillator.

The RCE-X is already in wide use by leading communication organizations and has proved its versatility and high performance. Correspondence is invited.

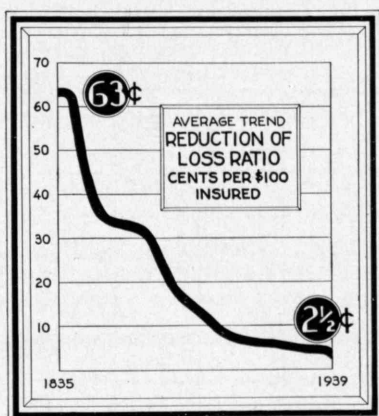


**NATIONAL COMPANY, INC., MALDEN, MASS.**

# FACTORY MUTUAL INSURANCE

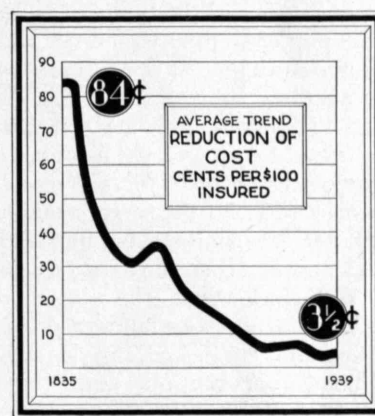
## *Successful in Business For 105 Years*

The first object of the Associated Factory Mutual Companies is the PREVENTION of loss and its costly interruptions to business. The second object is full REIMBURSEMENT if loss occurs.



The effect of Fire Prevention and careful underwriting on the Loss Ratio

**LOSS  
PREVENTION  
IS AN  
ENGINEER'S  
JOB**



The effect of Fire Prevention and careful underwriting on the Insurance Cost

"TECH" MEN predominate in the more important positions of the individual companies and of the jointly operated Inspection Department.

## MANUFACTURERS MUTUAL GROUP

HOVEY T. FREEMAN, '16, President

SIX COMPANIES UNDER SAME MANAGEMENT

\$3,000,000,000 INSURANCE IN FORCE

MANUFACTURERS MUTUAL FIRE INS. CO. . . . 1835  
RHODE ISLAND . MUTUAL FIRE INS. CO. . . . 1848  
STATE . . . . . MUTUAL FIRE INS. CO. . . . 1855

MECHANICS MUTUAL FIRE INS. CO. . . . . 1871  
ENTERPRISE MUTUAL FIRE INS. CO. . . . . 1874  
AMERICAN MUTUAL FIRE INS. CO. . . . . 1877

*"The Oldest and Largest of The Factory Mutual Offices"*

Business Confined Primarily to Industrial Plants  
For Further Information, Address Inquiries to Main Office  
PROVIDENCE, RHODE ISLAND

*With Us, the Interest of the Policyholder comes First—not Third*



## NUTRITION AND NATIONAL HEALTH

(Continued from page 325)

clear. From animal experiments the evidence is conclusive that resistance to paratyphoid infections in mice is greatly enhanced by an adequate diet. Further, this effect is shown to be even more pronounced in the second generation.

It has not been possible to confer an immunity to childhood diseases by the feeding of an optimum diet. However, and of more importance, the better-fed children usually recover; those poorly fed die in much larger numbers. Among babies and young children many deaths attributed to pneumonia, measles, whooping cough, dysentery, and other causes probably are due to lowered resistance resulting from malnutrition.

In Upstate New York during the eight years from 1915 through 1922, about 10 per cent of all measles deaths — a total of 203 — occurred in institutions for children. Dr. E. S. Godfrey described the children in these homes as "marasmatic, rachitic, and otherwise undernourished." In eight years, beginning in 1931, only two deaths from measles have occurred in these institutions. The case-fatality rate actually has been lower than in the general population. Better nutrition was not the only factor in the improvement, but as a part of an intensive program to lower infant mortality in these institutions Dr. Godfrey insisted that the diets be supplemented by cod-liver oil (not previously given) and by more milk, fruit, and vegetables.

Animals suffering from deficiency of vitamin A are susceptible to a variety of infections. The loss of resistance appears before other symptoms of vitamin A deficiency, even in animals receiving a diet which is only "nearly adequate." Like nearly fresh fish, a nearly adequate diet is not good enough. Moderate degrees of deficiency of several food factors lower animals' resistance to disease.

Recently, T. D. Spies has reported upon the results of administering Vitamin B<sub>6</sub> to patients who showed symptoms of extreme nervousness, insomnia, irritability, abdominal pain, weakness, and difficulty in walking. "Within four hours . . . all patients experienced dramatic relief of these symptoms, increased strength. Within 24 hours these symptoms had disappeared. One of these persons who had been unable to walk more than a few steps walked two miles within 24 hours after the injection of 50 mg. of Vitamin B<sub>6</sub>."

Lack of another part of the vitamin B complex causes graying of the hair in rodents. Suggestions of the possibility of curing baldness and of postponing gray hair in man are not proven. In the vitamin B complex also is a substance the lack of which causes necrosis of the adrenal glands in animals according to recent work at the National Institute of Health.

Vitamin K is necessary for the clotting of blood. A deficiency in this element may cause jaundice. It appears that a considerable number of deaths in infancy due to postnatal intracranial hemorrhages of the newborn result from a deficiency in this substance. A recent report by Wechsler indicates that vitamin E (tocopherol) caused recovery from severe spinal-cord lesions of amyotrophic lateral sclerosis. Moreover, a deficiency in

this vitamin causes sterility in animals. At least ten vitamins important to man have been isolated as chemical entities and eight have been made synthetically. Undoubtedly there are still others of which we know not yet.

Every year added knowledge is gathered also concerning the mineral needs of the human body. For life and health at least thirteen minerals seem essential, including calcium, phosphorus, iron, copper, iodine, sodium, cobalt, manganese, magnesium, potassium, chlorine, sulphur, and zinc. Investigations concerning the trace elements are only beginning.

In a recent report O. D. Abbott correlates anemia and stunted mental and physical growth among children, with the kind of soil and with a severe nutritional disease of cattle foraging on certain white and gray sands in Florida. The soils are deficient in iron, copper, cobalt, and possibly other minerals. The addition of these to the diets of both children and animals produced a dramatic change in nutrition. A further relationship between the amount of iron in the soil and that in locally grown vegetables was shown by analysis of turnip greens, which varied from 258 parts per million when grown on productive soils to 56 parts per million when grown on deficient ones. The fertility of the soil influences the food value of the crops grown upon it. Animals feeding on depleted soils produce depleted milk. For example, cows fed on a good grade of alfalfa hay produce milk with five times as much vitamin A in it as do cows fed on a poor grade of timothy hay. Thus, soil conservation has a direct relationship to nutritional status.

There is a very definite interrelationship between minerals and vitamin metabolism. In order for vitamin D, for example, to cure rickets, it is necessary that there be a proper balance between the amounts of calcium and phosphorus in the diet.

The body uses also twenty-two different amino acids, of which eleven must be secured from food, the others being synthesized in the body. These are produced in the digestion of protein and some of them are available only from animal sources. The vitamins, minerals, amino acids, carbohydrates, and fats interact upon each other. A deficiency of one may prevent the body from utilizing other essentials, even though these are available in the diet. The other factors still further complicate the problem. A diet which is adequate during health frequently is not adequate during disease. Various types of infection seem to burn up or prevent the utilization of essential food elements. Certain drugs, also, increase the daily need of the body for certain vitamins. Moreover, there is a direct interrelationship between substances in the diet and the natural secretions of the internal glands of the body in that complicated symphony we call body metabolism, growth, physiology — in short, life. It will thus be seen that forty-odd essential food elements are not merely interesting curiosities of the laboratory but are of concern to all persons, of all ages, in all economic circumstances, and in all geographic areas of the country.

There are definite limits to the preventive and curative effects of education for better nutrition: Economic factors are of basic importance. People on relief spend about five cents a person a meal (Continued on page 346)

# What's in it for me?



## Many cheering cups full of flavor from THE MELLOW FLAVOR BELT

The difference in the Beech-Nut blend comes from a large amount of those first-grade mountain-grown beans from the Mellow Flavor Belt. Careful roasting, accurate grinding and vacuum-packing . . . these, too, play an important part in giving you

coffee that has a fresh, full, mellow flavor. You'll enjoy Beech-Nut Coffee — it *is* good.



*The mile-high tropical garden*

### IN 2 GRINDS— VACUUM-PACKED

*Drip Grind*—For all drip and glass coffee makers.

*Regular Grind (Steel Cut)*—For percolators and coffee pots.

# Beech-Nut Coffee

*is moderately priced*



## NUTRITION AND NATIONAL HEALTH

(Continued from page 344)

for food. Families getting incomes of \$100 a month spend around ten cents a person a meal for food. The Department of Agriculture has estimated that if all families getting less than \$100 a month were able to increase their incomes to that level, there would be an increase of approximately \$1,900,000,000 in national food expenditures; the total national food bill would increase 14 per cent. In an effort to improve the diets of families on relief, the Department of Agriculture — through a food-stamp plan — makes possible the increase of food consumption from five cents a meal to seven and a half cents a meal.

When the nutrition problem can be defined more accurately as to size, nature, geographic location, and individuals affected, it can be attacked more effectively. Also, results can then be measured more precisely. Nevertheless, in the United States we *now* know enough about undernutrition to attack it as a national problem. We have the agricultural capacity to provide a good diet for the whole population.

In primitive times through a process of natural selection and survival, the people chose the best available foods. Thus, nations which did not or could not make a wise choice died out. The natural foods contain an adequate amount of the various food elements, but we destroy much of their real nutritional value by cooking and refining. The bolting of flour takes out 80 to 90 per cent of the vitamin B<sub>1</sub> complex and more than one-half

of the minerals. Because grain was ground in a primitive fashion, our diets of one hundred years ago were twelve times as rich in vitamin B<sub>1</sub> as are our diets of today. Moreover, we have doubled our per capita consumption of sugar during the past thirty years. Sugar furnishes fuel to the body, nothing else. Since so large a part of the calorie requirements of the body are furnished by sugar and white flour, it is difficult to secure the necessary protective elements. Cooking also destroys some of the vitamins. Vitamin C, for example, does not withstand heat or oxidation. Other vitamins and minerals are leached out in the water used in cooking. While in correcting specific dietary deficiencies it frequently is necessary for vitamins to be prescribed by a physician, the present tendency to buy shotgun vitamin products is largely wasteful. It seems ridiculous that we should take a natural food in which sufficient vitamins and minerals have been placed by nature, refine and remove these constituents, then purchase the same products in concentrated form at an additional price.

It is not easy to define good nutrition. In general, however, a person in a good nutritional state has flesh which is firm, skin which is elastic with a pinkish glow. His mucous membranes are red; his manner is alert; eyes are bright and sparkling; posture is good; his hair is glossy and soft; and there is sufficient fat to round out the body — cover up the angles.

The first step in improved nutrition is to recognize it as a national health problem. It is one which cannot be solved by individuals unaided. In the distant past, progress toward better nutrition was the result of the

## HYDRON METALLIC BELLOWS



Flexible metallic bellows — Bellows units filled  
and sealed with gases or liquids

*for*

Instruments — Refrigeration — Automotive — Air  
Conditioning — Heating and Ventilating Industries

**CLIFFORD MANUFACTURING COMPANY**  
**BOSTON**

WALTER B. CLIFFORD '06

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unconscious and instinctive groping of man for a better and more abundant life. What is now required is the conscious direction, on a national scale, of the natural tendency toward better nutrition. In addition to further research that we may know more about the relation of nutrition to health, a nutrition policy must be directed toward two aims — consumption and supply. Where income is adequate, education is effective, but there are definite economic limitations to educational effort. Proper feeding, especially in early life, is a first objective. Provision of supplementary diets through making our surplus agricultural products available to relief families is a valuable contribution. There should be a greatly increased milk consumption by children and expectant and nursing mothers. The provision of school meals would do much to increase the amount and improve the quality of children's diets.

Through governmental action, agriculture can be adapted better to the nutritional needs of the nation. Since agriculture has become an "assisted industry," it is not unreasonable that the government should direct this assistance so as to insure the production of materials essential to national welfare. The ways and means of accomplishing this seem quite feasible and follow naturally from the current measures for soil conservation. Home gardens, canning and preservation of food, encouragement of dairying in the cotton, wheat, and mechanized agricultural areas are important.

Freight rates are important factors in the final cost of many food products, especially the green vegetables and citrus fruits. Through lowered *(Concluded on page 348)*

**Enterprising business men and women** always feel that it is very

**and women** always feel that it is very important to stay at the *right* hotel when away from home. If you are so minded, why not believe us when we say that in Boston it is the

**COPLEY-PLAZA**



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*Illustrated folder on request*

*The* **COPLEY-PLAZA.** *Boston*

ARTHUR L. RACE, *Managing Director*

## A STATEMENT IN UNIQUE FORM



The statement below, made up in an original way, is presented with the object of calling particularly to your attention the care with which the policyholders' interests are protected by the Boston Insurance Company.

# Boston Insurance Company

INCORPORATED 1873

*Summary of December 31st, 1939 statement filed with Massachusetts Insurance Department*

## LIABILITIES

Losses in Process of Adjustment.....	\$ 793,956
Reserve for Losses Unreported.....	199,500
Reserve for Federal Taxes.....	80,000
Reserve for Dividends.....	270,000
Unearned Premium Reserve.....	4,615,817
All Other Reserves and Liabilities.....	1,487,862
Capital.....	\$3,000,000
Surplus.....	<u>14,650,936</u>
<b>Policyholders' Surplus.....</b>	<b>17,650,936</b>

\$25,098,071

## ASSETS

Cash .....	\$ 793,956
Cash .....	199,500
Cash .....	80,000
Cash .....	270,000
Cash .....	317,140
U. S. Government Bonds .....	4,175,125
State, County and Municipal Bonds .....	123,552
State, County and Municipal Bonds, Rail- road and Public Utility Bonds .....	1,487,862
Public Utility and Corporation Bonds ....	430,680
Canadian Government, Provincial and Municipal Bonds .....	106,831
Stocks .....	6,995,643
Old Colony Insurance Company .....	8,112,678
Real Estate (Home Office Building) .....	975,000
Premiums in Course of Collection and Other Admitted Assets .....	1,030,104
	<u>\$25,098,071</u>

\$25,098,071

*Home Office:* 87 KILBY STREET, BOSTON, MASSACHUSETTS  
Fire, Marine and Automobile Insurance

WILLIAM R. HEDGE, '96, *President*  
HENRY R. HEDGE, '96, *Vice-President*



# WRITE OUR ENGINEERING DEPARTMENT

• SEND BLUE PRINTS •

WE WILL  
OFFER SUGGESTIONS  
AND GIVE ANALYSIS OF  
WHEN AND WHY IT PAYS  
TO FORGE IN BRASS,  
BRONZE, COPPER AND  
ALUMINUM



# HARVEY METAL CORPORATION

President, H. B. HARVEY '05

Plant and General Offices:  
1675 WEST 74TH ST., CHICAGO

District Offices:  
NEW YORK CLEVELAND DETROIT  
WASHINGTON ST. LOUIS

## NUTRITION AND NATIONAL HEALTH

(Concluded from page 347)

freight rates, wider distribution of these products would be encouraged. Tariff policies also have a direct influence on food costs and, therefore, on food consumption and should be made with a view to improved national nutrition. Refrigeration and storage facilities, lower distribution costs, quick and adequate transportation — all are measures for better nutrition.

In a publication of the International Labour Office, it is pointed out that "there is also growing support for the proposal that State provision for the adequate nutrition of special groups of the population such as infants, school children, expectant and nursing mothers, upon whose well-being the future of society depends, should be treated as a social obligation akin to that of popular education."

In a problem as complicated as that of national nutrition the solutions similarly are complicated but not impossible. All authorities point to the crucial importance of adequate nutrition for certain population groups. One good meal a day for every school child would save, not burden, educational budgets. For expectant and nursing mothers, for babies, and for many diseased patients, food is medicine. For those unable to provide for themselves proper food in adequate amounts, the community should accept responsibility in the way it now accepts responsibility for seeing that no one starves. My proposal is simply that we should allow no one to starve, but I point out that science has given us a new definition of starvation. If a person actually starves to death, the community is at least relieved from the burden of supporting him in sickness and disability through long years. In the new concept, starvation may be even worse in its ultimate social effects than were the ancient famines which periodically killed off a large part of the population.

Month by month in dozens of research centers, evidence is accumulating as to the influence of diet and nutrition upon the physical and mental status of the race. Dr. H. C. Sherman has stated, and I agree, that experience to date indicates that we can defer senility and increase by seven years the average *virile* span of life. This would mean more in terms of longevity than to wipe out cancer as a cause of death. Through adequate nutrition we have it in our power to build a new race of people in America.

## WILD-LIFE PORTRAITURE

(Continued from page 328)

Fix the reflector above, and at one side of, the camera. Never use a flash lamp mounted on the camera itself, as the flat lighting that will result is most objectionable. Two lamps may be used, but the use of a reflector instead of one of the lamps would save expense. If available, a white wall will do very well. Focus on some point which will remain in position no matter how much the mouse runs about, and then you're ready to start.

A typical solution to a problem of this sort will serve to illustrate the procedure: I was making a series of pictures of native (Continued on page 349)



# Calendars

Builders of sales  
and good-will, created  
and lithographed by

# FORBES

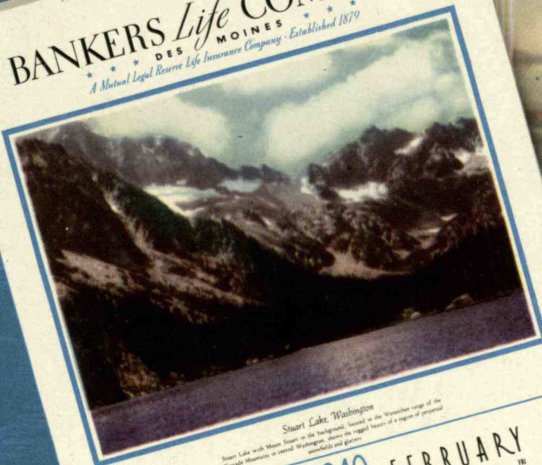


The pause  
that refreshes

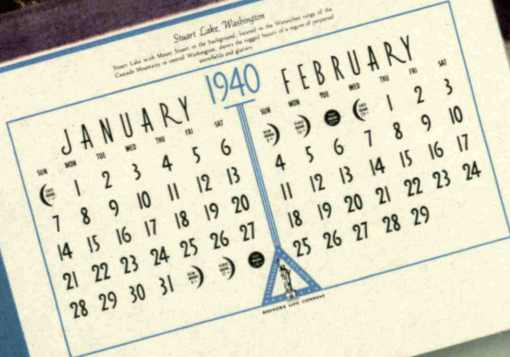


GREETING

**BANKERS Life COMPANY**  
DES MOINES  
A Mutual Legal Reserve Life Insurance Company - Established 1879



Stuart Lake, Washington  
Stuart Lake with Mount Rainier in the background, located on the Washington coast of the Cascade Mountains is a scenic Washington lake, the most beautiful of a regional group of mountains and lakes.



1940	JANUARY 1940						
	SUN	MON	TUE	WED	THU	FRI	SAT
1939	☾	☾	☾	☾	☾	☾	☾
1		1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27
5	28	29	30	31	☾	☾	☾

1940	FEBRUARY 1940						
	SUN	MON	TUE	WED	THU	FRI	SAT
1939	☾	☾	☾	☾	☾	☾	☾
1		1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27
5	28	29	30	31	☾	☾	☾







*Straight Sailing*  
TO HEALTH AND HAPPINESS WITH

**WHITING'S**



*Seasons Greetings*

MAY HEALTH, HAPPINESS AND CONTINUOUS GOOD CHEER  
BE YOUR SHARE OF LIFE THROUGHOUT THE COMING YEAR.

*Your Whiting Milkman*

**QUALITY FOR A CENTURY**

Forbes creates and produces millions of calendars each year — no stock designs; each calendar developed to do a specific job. Let us create a calendar for you — we'll do our best to merit the same measure of enthusiastic satisfaction expressed in this letter from the Whiting Milk Company.



## "REPEAT ORDERS PROVE THE SUCCESS OF THE WHITING 1940 CALENDAR"

Calendars, when properly conceived, designed and executed, are mighty potent sales and good-will items.

Look at what you get in a calendar:

- A real consumer demand; ✓
- No space charge; ✓
- Advertising right at the point of use; ✓
- Absence of competitive advertising or competitive interest; ✓
- A full-year showing — every hour of every day; ✓
- Low circulation cost; ✓
- Opportunity to identify local retail dealer; ✓
- A valuable good-will builder. ✓

**WHITING MILK COMPANY**  
570 RUTHERFORD AVENUE, BOSTON, MASS.  
TELEPHONE CHA 2860

January 28, 1940

Mr. Frank Moore  
Forbes Lithograph Manufacturing Co.  
P. O. Box 513  
Boston, Massachusetts

Dear Frank:

Well, we did it...just what was planned way back last August.

When a calendar is right and people ask for it, write in, particularly for a certain one, when the picture and copy make newspaper publicity and the slogan is repeated both by word and in other advertising...it follows naturally that a demand has been created. The repeat orders prove the success of the Whiting 1940 calendar.

The Forbes craftsmen are to be congratulated for their fine work. Let me thank you, personally, for so carefully handling and supervising all the details of Kodachrome photography, layout design, colors, printing and delivery. We find it a pleasure to work with you.

With kind personal regards, I am  
Sincerely yours,  
WHITING MILK COMPANY

*Donald W. Gardner*  
Donald W. Gardner  
Director of Public Relations

**FORBES**



**LITHOGRAPH CO.**

P. O. BOX 513 • BOSTON

NEW YORK

CHICAGO

CLEVELAND

ROCHESTER

DETROIT



## WILD-LIFE PORTRAITURE

(Continued from page 348)

mice, and among the subjects was a meadow mouse—a burrower who hates to be caught out in the open. I first tried to get him in position on a piece of sod with an overhanging grass background, but it was no go. As soon as I'd get him out of the grass on one side, he'd dive in again on the other. Finally I made an open-front box of wire screening; placed field stones on both sides and at the back, with no space behind in which to hide; set a short length of mailing tube between the side stones, facing the camera and about an inch out from the back; and covered the tube completely with mud and grass. At the mouth of the tube I made a narrow mud platform, on which the camera was focused. Then the mouse was placed at the back of the tube. He immediately ran inside to get out of sight. When he came out the other end and stopped to look around, flash went the lamp. After he'd been adequately recorded for posterity, the whole equipment was then covered with snow and served the same function for photographing a pine mouse. A lot of work? Sure it was, but the results could never have been attained by any other method.

Birds and beasts seldom do what you expect, at least when you're trying to get their pictures. The most beautiful setup in the world never seems to please them. You can provide the perfect setting for a mouse, the sort of place you know you'd enjoy if you were a mouse, and he'll always want to be somewhere else. As a conse-

quence it's best to be prepared to make changes at a moment's notice. Instead of sitting on soft green moss at the base of a lichen-covered rock, he'll invariably prefer the top of the rock. Of course the top may provide an equally good setting, but you'll have to be ready to make a quick switch.

The same technique may also be used in other and less-confined situations. A bird feeding tray in winter offers almost unlimited possibilities. To get the birds coming, use any kind of a feeder you prefer, changing it later to an open tray to take pictures. Nail a branch to the side, crop off all portions outside the field of your camera, and then wait for a good pose. Of course you'll have to orient the tray for proper sunlight and make sure that the background is acceptable or else put in one of your own. Our Christmas tree got into a lot of pictures last winter as a deep-woods background. Chickadees will come in while you're standing out in the open, but for most other birds you'll need a blind. An old crate or almost any kind of cover will do, and using it is far more satisfactory than sitting inside the house and pulling a string, even if it may not be so comfortable.

After you've exhausted the possibilities of that particular perch, set up a pine branch with a fully opened cone properly located. Stuff the far side full of sunflower seeds, remove the rest of the seeds from the tray, and every bird will light in the right place. Another possibility is to set up a section of a tree trunk and stick the seeds in crevices in the bark or in a cavity. There are countless variations on this theme. Make certain of one thing, though: Give the birds (Continued on page 350)

*Here They Are!*

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## WILD-LIFE PORTRAITURE

(Continued from page 349)

speed and lots of it. At 1/50 of a second, you'll get only a blur. Even at 1/150 they'll quite often beat the shutter. The minimum is really 1/200, and since it's necessary to stop down as much as possible, a flash is often required. A General Electric No. 16 gives enough light for a speed of 1/200 at f:32.

Probably these illustrations have indicated sufficiently the problems involved in this branch of photography and some of the methods used in their solution. To cite more case histories might possibly be interesting but not necessarily helpful, since each presents individual difficulties which are never met in the same manner twice. There are countless other phases which have not been mentioned, mainly because they introduce no new procedures. They should not, however, be overlooked. It is an inescapable fact that the success of a photograph has not the slightest connection with the difficulties overcome in taking it. A well-composed flower study may have much more appeal than a shot of a charging elephant.

Just a word, then, about the simpler types which still present their problems — young birds, for example. Except for game and sea birds and the birds of prey, young birds are not very photogenic until they're fully feathered. A feeding shot at the nest is, of course, another matter, but I'm thinking now of the young birds themselves. When they're ready to leave the nest, they make excellent subjects, but the greatest care must be

taken in handling them. If birds are taken from the nest before they're ready to leave of their own accord, they're apt to become dissatisfied with the old home and refuse to return to it, no matter how many times you replace them. The end can be only disaster, for they fall prey to cats or other predators in short order. A close watch must therefore be kept on the nest, and not until the birds actually start out for themselves should they be handled.

Flowers, the simplest of all subjects, require a bit of thought for best results. They seldom grow in locations which are ideal for photographic purposes. The backgrounds are usually unpleasing, the sun is rarely right, and even a slight breeze creates motion which requires a fairly wide-open lens. Whenever possible, I bring the flowers indoors. With small flowers the taking distance is relatively constant, the lighting (two photofloods) is a constant, and therefore the stop and exposure are known, so that after the first few exposures no further attention is needed from the mechanical standpoint. The necessity for guarding against confusing backgrounds is of paramount importance here, and the same considerations which have been previously stated apply. Dramatic, if not entirely natural, effects can be readily obtained by the use of extreme contrast. You won't want too many prints of this sort, but a few are most acceptable. Use a dead-black background and set in front of it a very few pieces of grass, pine, or something else which will give a subdued over-all pattern. Such a scheme is particularly effective with a white or light-colored flower. The print (Concluded on page 352)

*Technical Advances* IN THE ART OF TEXTILES have wrought notable changes, not only in finished products, but in many machines used for processing textile fibres.

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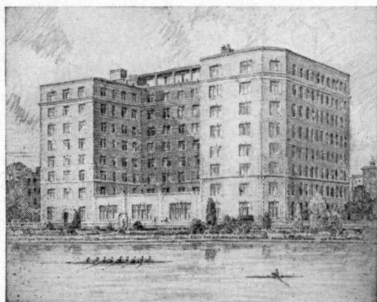


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## WILD-LIFE PORTRAITURE

(Concluded from page 350)

should merely suggest this background — keep it from being solid black. Natural backgrounds, such as field stones, stumps, and so on, are excellent in the right places — but don't forget they have to be right. This use of studio setups for flower photography is particularly helpful for color work. With three 3,200-degree Kelvin lamps (in case you're using Kodachrome) and stopping down to  $f:32$ , a speed of four and a half seconds is required. Even though you could get this same amount of light in the woods, one would rarely find a day still enough for such an exposure.

I haven't mentioned color shots until now. They're difficult to use indoors for animal subjects, as the same considerations of speed apply and if you pour enough light to allow for speeds of  $1/100$  of a second or better, the animals won't pose, and even if they do, they'll be squinting and unnatural. Frogs are easy enough. Occasionally one will leap off in the middle of a three-second exposure, but in general they'll co-operate. The recently introduced color-corrected flash lamps offer possibilities, particularly since they are supposedly balanced for daylight synchronization. For the few uses I have made of them, these lamps have been fairly successful and warrant further experimentation.

I started taking nature pictures some ten years ago because I found the field a tremendously fascinating one. I soon discovered there was very little competition among either amateur or professional photographers, and wondered a bit if there was something wrong with my make-up. Why didn't other people enjoy this type of photography, too? With the passage of years I have discovered they do. An amazing number of photographers try it but after a constant series of disappointments give it up and go back to buildings and babies. Patience, sometimes an inordinate amount of it, is an essential. The main troubles, however, seem to be a lack of knowledge of the creatures whose photographs are attempted and the assumption that the only method available is camera hunting. It is to these people that this article is addressed. May it give some of them inspiration to try again in the field of wild-life portraiture.

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## MYTH AND METAL

(Concluded from page 330)

A modern interpretation of the story told in the *Eddas* is given by Matthew Arnold:

. . . The final day  
When from the south shall march the fiery band  
And cross the bridge of Heaven, with Lok for guide  
And Fenris at his heel with broken chain;  
While from the east the giant Rymer steers  
His ship, and the great serpent makes to land;  
And all are marshall'd in one flaming square  
Against the Gods, upon the plains of Heaven. . . .

Tradition has it that not quite all the gods perished in this catastrophe — that a few survived, hidden from the Hallstatt peoples in the depths of the forest. The climate remained difficult for many years, however — cold and wet. The oak and beech forests were replaced by spruce. The bogs in Ireland deepened — witness the 26 feet of growth in the Donegal County bog — and the remains of the lakes dwellers' villages were submerged by the rising waters of the lakes. It is interesting that unusual drought in recent years has lowered the water level in some of these lakes, particularly in Switzerland, and exposed the remains of some of the long-hidden dwellings. During this wet, cold period, the seashore of western Europe gradually settled, submerging many of the great Bronze Age megalithic monuments, some of which in Brittany, as in the Scilly Isles, are visible today only at very low tide.

But gradually the climate changed for the better again, so that by the year 400 B.C., according to students of the subject, it had become very much less severe, and

in northwestern Europe a new culture slowly grew up based on iron instead of bronze. The few remaining descendants of the Bronze Age could leave their forest fastnesses and start to build again a new civilization, as foreseen by the vala, or druidess, in the *Elder Edda*:

She sees arise  
The second time,  
From the sea, the earth  
Completely green:  
Cascades do fall,  
The eagle soars,  
From lofty mounts  
Pursues its prey.

The gods convene  
On Ida's plains. . . .

The fields unsown  
Yield their growth;  
All ills cease. . . .

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## THE INSTITUTE GAZETTE

(Continued from page 335)

### DEPARTMENT OF MILITARY SCIENCE AND TACTICS\*

THE Committee find that the personnel of the Department are continuing the highly satisfactory standards of work that have prevailed in the past and are making earnest efforts to (Concluded on page 354)

\* Members of this Committee for 1939-1940 are William E. R. Covell, '23, Chairman, Francis J. Chesterman, '05, Theodore B. Parker, '11, Lucas E. Schoonmaker, '17, Malvern-Hill Barnum, and Edward C. Harwood.

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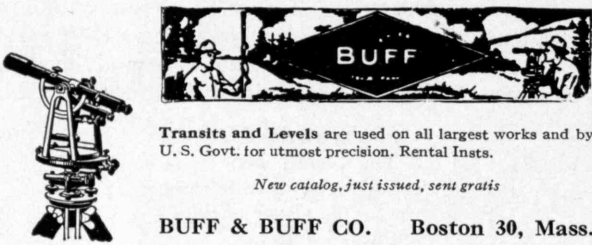
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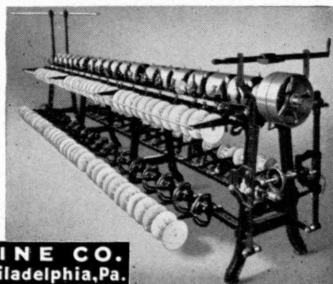
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## THE INSTITUTE GAZETTE

(Concluded from page 353)

obtain even better results. The present enrollment, which is the War Department limit, is 326 students, as compared with the limit of 215 students two years ago. The increase was made possible by additional appropriations by Congress.

There are, however, a few problems which, if satisfactorily solved, would permit this Department to increase its utility both to the Institute and to the government. The first of these is the need for fireproof storage space for government equipment utilized by the Reserve Officers' Training Corps. The Committee recommend that the Institute give immediate consideration to this important matter. Although it is recognized that existing funds probably will not make possible the construction of suitable facilities in the immediate future, it is strongly urged that fireproof storage space for this equipment be placed, with high priority, on the schedule of new building for the Institute.

The present rifle range is unsatisfactory in that it is housed in a temporary frame building and has but five firing points. The large number of students who are required to take the course in rifle marksmanship should have a modern range and at least ten firing points. The Committee were pleased to find that these needed facilities are included in the building program of the Institute and recommend that they be continued thereon with their present high priority.

The difficulty and danger encountered by the R.O.T.C. students in crossing Massachusetts Avenue to and from military drill were discussed by the Committee. This problem would be obviated by the construction of an underground passageway. The Committee are cognizant of the cost and difficulties but recommend that the matter be not considered closed.

The mechanization of armies today and the traditional dependence of our country on a small regular army make it imperative that our War Department keep up with technological progression or even lead in those specialized fields pertaining directly to its work. This fact has been recognized by the government, and special boards, so called, have been set up in each branch of the Army, charged with the duty of keeping our defense forces abreast of scientific progress. The development by the Institute of closer relationships with industry, especially in connection with research projects, has led this Committee to consider the possibility of a parallel arrangement that would establish a closer relationship between Institute activities and these military research boards and other governmental agencies responsible for the national defense.

Active research by graduate and special research students has a stimulating effect both on instructors and on students in the undergraduate courses because it fosters recognition of the facts that our scientific knowledge is vital and growing and that there is still plenty of room for achievement. We believe that men of science and military men will benefit by a better understanding of each other's methods and views.

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CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI AND OFFICERS

## Honors and Awards

¶ To OTIS D. FELLOWS '04 and CHARLES E. GREENE '10, the Clemens Herschel prizes, and to DEAN PEABODY, JR., '10, the Designers Section Prize, of the Boston Society of Civil Engineers.

¶ To WILLIAM H. BRADSHAW '07, the Schoellkopf Medal of the American Chemical Society for work in developing Cordura, rayon fabric for use in automobile tires.

¶ To JOHN G. B. HUTCHINS '31, the David A. Wells Prize of \$500 for outstanding original research in economics.

¶ To DAVID L. MACADAM '36, the Adolph Lomb Medal for noteworthy contribution to optics.

¶ To WILLIAM PARRISH '39, First Prize in annual competition for Walker prizes in Natural History from the Boston Society of Natural History. Honorable mention to CLARK GOODMAN, Staff.

¶ To CLAUDE S. HUDSON, Former Staff, the 1940 Theodore William Richards Medal of the Northeastern section, American Chemical Society, for conspicuous achievement in carbohydrate chemistry.

## Appointed or Elected

¶ FRANK B. WALKER '01, President, Boston Society of Civil Engineers; ALBERT HAERTLEIN '18, Vice-President; SAMUEL M. ELLSWORTH '16 and THOMAS R. CAMP '25, directors; and CHARLES R. MAIN '09, re-elected Treasurer, at the same meeting.

¶ EARL S. BARDWELL '06, President of the Montana section of the American Institute of Mining and Metallurgical Engineers.

¶ LUIS DE FLOREZ '11, chairman of the Connecticut Aeronautical Development Commission.

¶ DAVID DASSO '12, Secretary of the Treasury, Republic of Peru.

¶ JOSEPH W. BARKER '16, a Vice-President of the American Institute of Electrical Engineers.

¶ CLAIR E. TURNER '17, member of the newly formed commission on health education of the American Association of School Administrators.

¶ EDWARD P. WARNER '17, member of the Civil Aeronautics Authority.

¶ PHILIP G. RHODS '27, member of the wages and hours committee of the leather industry.

¶ ROBERT B. SCHILDKNECHT '30, state architect in Ohio.

## Written

¶ By FRANK CUSHMAN '01, *Training Procedure*, John Wiley.

¶ By JOHN AYER '05, "Gloucester Fish Pier, A New Plant for an Old Business," *Industry*, April.

¶ By DOUGLAS C. MCMURTRIE '10, "The Invention of Printing," the *Kablegram*, May.

¶ By NATHAN CHERNIACK '22, "Measuring the Potential Traffic of a Proposed Vehicular Crossing," *Proceedings*, American Society of Civil Engineers, February.

¶ By WEAVER W. ADAMS '23, *White to Play and Win*, David McKay.

¶ By CHARLES T. BURKE '23, "Engineering Administration in a Small Manufacturing Company," *Proceedings*, Institute of Radio Engineers, January.

¶ By PAUL J. CARDINAL '24, "Vitamin B<sub>1</sub> as a Key to Increased Flour Consumption," *American Miller*, April.

¶ By SAMUEL G. ESKIN '26, "Energy Measurements of Reigniting A.C. Arcs," *Journal of Applied Physics*, September.

¶ By CYRIL S. SMITH '26, "Biringuccio's 'Pirotechnia' — A Neglected Italian Metallurgical Classic," *Mining and Metallurgy*, April.

¶ By MARSHALL W. JENNISON '27, "Bacteria: The World's Smallest Workers," *New England Naturalist*, April.

¶ By HERMON H. SCOTT '30, "A New Sound-Level Meter," *General Radio Experimenter*, April.

¶ By ROLF ELIASSEN '32, "Solving Design Problems," *Municipal Sanitation*, April.

¶ By JOHN M. LESSELLS, Staff, "Significance of Tension Test," *Mechanical Engineering*, April.

## Lecturer

¶ ARTHUR A. BLANCHARD '98, on "The Metal Carbonyls," at Brown University, March 23.

¶ JAMES M. BARKER '07, on "Banking and Business Cycles," at the Chicago chapter of the American Institute of Banking, March 14.

¶ WILLARD C. BROWN '16, on "What's New in Lighting," at the science forum of the New York Electrical Society, April 17.

¶ JOHN E. BURCHARD '23, on "What Research Can Do for Housing," at the Vermont Wood Products Conference, May 17. At the same conference ROSS CUNNINGHAM, Staff, spoke on "Principles of Marketing Lumber and Wood Products," and a brief talk was given by RALPH E. FLANDERS, Corporation.

## DEATHS

\* Mentioned in class notes.

¶ WILLIAM F. CODD '76, March 14.

¶ SAMUEL T. BRALEY '79, March 27.

¶ JOHN W. STEARNS '87, February 12.\*

¶ SOLOMON STURGES '87, April 3.

¶ MARY HUTCHESON PAGE '88 (Mrs. George H.), February 10.

¶ GEORGE C. WALES '89, March 21.\*

¶ HENRY H. POPE '90, April 19.

¶ GEORGE W. CHICKERING '91, March 14.\*

¶ A. MARION MERRILL '92, March 9.

¶ RUEL C. TUTTLE '93, March 10.

¶ WINTHROP T. CASE '94, October 30.

¶ ZABDIEL B. ADAMS '96, March 16.

¶ FREDERIC W. FULLER '96, April 19.\*

¶ EDWIN S. NORTHUP '96, March 31.

¶ WALTER E. SPEAR '97, March 29.\*

¶ JOSEPHINE D. LOWE '99 (Mrs.), October 14.

¶ PHILIP L. BUXTON '01, March 24.\*

¶ FRANCIS D. AVERY '02, March 6.\*

¶ PIERRE B. PENDILL '02, November 15.

¶ JOHN R. BATES '03, March 12.\*

¶ MARY SNOW '03, April 4.\*

¶ HENRY P. DRAKE '04, April 19.

¶ WALTER J. GILL '04, date not known.

¶ CHARLES R. BOGGS '05, April 1.

¶ HARRY A. FRAME '07, August 1.

¶ ELLIOTT S. CHURCH '08, January 3.

¶ CLIFTON G. GILPATRICK '09, April 23.\*

¶ PHILIP S. AVERY '11, April 12.\*

¶ BALA P. MATHUR '11, January 26.

¶ JOHN B. WALCOTT '11, March 7.

¶ ALBERT GOODNOW '13, January 9.

¶ CHARLES H. ROBINSON '23, February 22.\*

¶ FREDERICK B. WOLF '28, April 19.

¶ THOMAS ADAMS, Staff, March 24.

¶ EDWIN T. COLE, Former Staff, February 24.



# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *Technology Club of Central Pennsylvania*

Our Club held a meeting at the University Club in Harrisburg on April 24. A member of our own group, Frank A. Robbins, Jr., '02, general manager of the Steelton plant, Bethlehem Steel Company, spoke to us on "What Industry Expects of the Technically Trained Man." His talk opened for us many interesting and diversified thoughts, and an open period of questions and answers followed. The general discussion became so engaging that it was necessary to close the meeting before all of our ideas and arguments could be expressed, so that the members from out of town could depart. We all profited greatly from Mr. Robbins' speech and the discussion.

We were glad to welcome as guest John T. Hummer, father of John L. Hummer '43. The following members were present: Gardiner C. Wilson '15, Harry W. Goldthwaite '99, Harold R. Spaans '30, Louis S. Morse '96, Francis E. Thomas '17, Edgar A. Weimer '98, Clifford J. Walton '14, Breese J. Stevens '23, Eldor J. Mink '22, Walter A. Johnson '38, Byron E. James '32, Emil T. P. Neubauer '33, Tien P. Kuo '24, Andrew R. Brugnani '26, Robert D. Morton '37, Francis E. Daniels '07, Glen R. Slonneger '37, John P. Connelly '28, John V. Masterman '26, Clark A. Bryan '03, James H. Toas '30, and Percy E. Tillson '06. — HAROLD R. SPAANS '30, *Secretary*, 1819 Elm Street, New Cumberland, Pa.

### *Technology Club of South Florida*

At Yeager's Roof on the Professional Building in Miami on April 10, the Club was honored to have as its speaker, Erwin H. Schell '12, Professor of Business Management and Head of the Department of Business and Engineering Administration at Technology. We were glad to welcome as guests Gustavo Padrés, Jr., consul from Mexico, and Eduardo Hernandez, Cuban consul. Members present included Howard C. Judson '02, Morris N. Lipp '20, Fred E. Zurwelle '20, Edward I. Mandell '21, Clarence P. Thayer '23, Thomas P. Coogan '24, Richard L. O'Donovan '27, William J. Knox '29, B. Howard Brown '30, Frank H. Hankins, Jr., '30, Carl W. Orleman '31, Samuel S. Saslaw '33, John J. Ostlund '35, and Russell H. Brown '38. — CLARENCE P. THAYER '23, *Secretary*, 1760 Northwest 41st Street, Miami, Fla.

### *Technology Club of Milwaukee*

On April 5 we held the first meeting in recent years to which the ladies were invited. The response was most gratifying,

and it looks as if we can safely call it "the first annual spring party." The party was held at the Shroeder Hotel, and consisted of dinner and dancing in the main ballroom. We also had a private room where we assembled before the party. One of the high lights of the evening was the spectacle of the Secretary trying to perform introductions. All went well at first when the party was small and the couples were matched; but as the ladies separated from the men with whom they were identified, confusion reigned. The Secretary is still recuperating.

We felt especially honored by the fact that two Madison couples drove ninety miles for our party. We look forward to seeing them again, and hope that we can continue to attract Alumni from Madison and near-by cities.

The ladies seemed to have as much fun as — or more than — the men, and several were heard to remark that there would be angry protests if the idea were not continued next year. — In only one respect could our organization be said to be sadly inadequate: vocal ability. Our able Alumni Secretary in Boston had generously supplied us with song sheets; everybody knew the words; but the chorus would hardly have attracted any talent scouts who might have been lurking about. Fortunately, we picked our private room for the tryouts, after which we abandoned any thought of giving the people in the main ballroom the benefit of a concert.

Attending were Professor and Mrs. John F. H. Douglas '05, Mr. and Mrs. Leland S. Woodruff '06, Mr. and Mrs. Kenneth B. Howell '12, Mr. and Mrs. Julius W. Werra '22, Mr. and Mrs. Roland H. Becker '22, Professor and Mrs. Randall W. Ludd '23, Mr. and Mrs. Edgar B. Godley '26, Mr. and Mrs. Ralph E. Boeck '28, Mr. and Mrs. Erling S. Mathiesen '29, Mr. and Mrs. Warren A. Bjorn '34, Mr. and Mrs. Daniel J. O'Connor, Jr., '37, Lemuel D. Smith '06, George F. McClellan Chase '38, Robert M. Osborn '36, and Miss Barbara French, all of Milwaukee. Mr. and Mrs. Bruno H. Werra '32 came from Waukesha, Wis.; Mr. and Mrs. Thomas G. Harvey '28 and Mr. and Mrs. Graham Walton '30, from Madison, Wis.; and Miss Mary Lou Leshner, from Elgin, Ill. — ROBERT M. OSBORN '36, *Secretary*, Box 37, West Allis, Wis.

### *Technology Club of New York*

The annual smoker, held on April 3, attracted more than two hundred members and their guests. The evening was a very enjoyable one and resulted in several new membership applications from Alumni who were attending a function at the new clubhouse for the first time. Among the more important class and group functions held at the Club during

April were the Honorary Secretaries' luncheon on the ninth, the '09 luncheon on the thirteenth, and the '33 dinner on the seventeenth.

Alumni visiting the city for the World's Fair are invited to make use of the Club's facilities. The clubhouse, which is located at 24 East 39th Street, just off Madison Avenue, has its own restaurants, grill-room, and taproom, as well as overnight hotel service. Guest privileges for all out-of-town alumni visitors will be issued at the Club, and a complete staff will be at the service of guests. — JAMES P. EDER '34, *Secretary*, 24 East 39th Street, New York, N. Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

### *M.I.T. Club of Northern California*

Karl T. Compton was the honored guest at a lively dinner given on the evening of Thursday, March 28. A group of eighty-one Technology Alumni, lady friends, and wives were on hand to greet Dr. Compton, and the Engineers' Club of San Francisco did itself proud in the serving of a delicious turkey dinner.

First arrivals were at about six o'clock, and from then until we were called to dinner at about quarter to seven a steady stream of Alumni and ladies kept our one elevator busy. Dr. Compton arrived at 6:15 p.m., and since he honors us with his presence but once every five years, meeting him was a new experience for most of our older members.

Our Club President, Dick Cheney '27, announced that a short intermission was necessary after dinner so that the moving picture screen could be set up and the dining room rearranged into a miniature theater. This gave us a chance for a moment's chat again with Dr. Compton, and in about twenty minutes we all returned to our chairs for an interesting review by Dr. Compton of present activities of the various Departments at the Institute, well illustrated with slides showing the more spectacular features. The entire group felt that Dr. Compton should visit the West Coast more frequently. Arrangements for the evening were made by Arthur C. Sutton '26, Rolfe A. Folsom '18, and Jack Nichols '22, and finances were handled by our Treasurer, Elmar Piel '38. — BERT O. SUMMERS '34, *Secretary*, 1230 Bonita Avenue, Berkeley, Calif.

### *Washington Society of the M.I.T.*

The Society held its March meeting on the fifteenth at 5 p.m. at the Y.W.C.A., 17th and K streets, N.W., with sixty-two attending. Ed Merrill '09, President, called upon Henry Randall '31, Honorary Secretary, who commented briefly upon

the scholarship situation, saying that a decision must be made shortly, and members were urged to call to the attention of the committee all likely prospects. Last year one student was given full tuition scholarship for the first year, and six other students were given some financial aid. Randall introduced a few of our "youngsters," including Parks '87, Brown '88, Stone '89, and Swan '91. Mert Emerson '04 introduced his guest, Robert Jackson, and Randall, his guest, Mr. Hobbs. President Merrill mentioned the illness of Alfred Hanson '14, and a motion was passed to send him flowers and our wishes for prompt recovery.

The speaker of the evening, Garland Suggs, chief turret captain, master diver, and instructor at the Navy Diving School in Washington, began with the background of diving in the Navy. In the old days, diving comprised a six weeks' course in connection with other work, practice dives being taken in Georgetown in the Potomac River, starting from 30 feet, graduating to 60 feet and then to 90 feet. At the present time, diving begins in a tank which is well lighted and provided with visibility, so that the cadet divers can be closely observed as to their progress and difficulties, if any. They work with hand tools doing jobs like cutting rivets under water. A beginner in this tank may take as long as three and a half hours to cut off a 5/8-inch rivet but, as Suggs remarked, finally is able to cut one off in thirty minutes "without any effort at all." The next step is the use of power tools, electric welding torches, and so on. In the meanwhile, the divers are gradually put down to lower depths, finally to 300 feet. Nearly all applicants succeed in reaching this distance, probably because of careful selection. It is important that a diver be most capable and dependable because usually his word must be taken; it cannot very well be checked. At the present time, there are 300 or 400 second-class divers, 220 first-class divers, and 16 master divers in the Navy. The training in the Navy Diving School is very thorough, and upon graduation the men get practical experience in diving work. The course includes work in the river, where visibility is not so good, and deep-sea diving, which really counts. Mr. Suggs told a number of anecdotes based upon his experiences — one where he had to shove his helmeted head into an airplane fuselage, although water movement might have cut off his arm, another where he had speared a fish and found he had thus baited himself for sharks. He said, however, that the sharks do not bother much; the diver looks as bad to the shark, apparently, as the shark does to the diver.

The newspaper stories of torpedo-tube escapes he classed as impossible and called them "Hollywood escapes." He described the bends (due to nitrogen assimilation in the blood), decompression, use of helium to eliminate mental reactions from deep-sea diving, and stated that the Navy expected to do 500-foot open-sea diving in Portsmouth in July, using helium mixed with oxygen, instead

of nitrogen and oxygen. Other items covered were a description of air embolism and its causes; the use of the Momsen lung against poisoning from carbon monoxide or chlorine and as a life preserver; a complete, clear, concise description of the diving bell used in the Navy. The description of the saving of the men from the U.S.S. *Squalus* and of the subsequent salvage operations was most interesting. Mr. Suggs estimated salvage costs as about \$247,000 for the \$5,000,000 ship which was recommissioned in May.

The talk was doubly appreciated by the members, first because of its completeness, and second because of the delightful, informal narrative treatment. The following members and guests enjoyed the talk and the excellent dinner following, served by the Y.W.C.A.: Garland Suggs, guest speaker, Granville H. Parks '87, Charles L. Brown '88, George W. Stone '89, James Swan '91, Barron P. DuBois '92, James C. Kimberly '94, William H. McAlpine '96, Joseph W. Clary '96, Proctor L. Dougherty '97, Benjamin A. Howes '97, Harry L. Grant '00, Paul Weeks '02, Walter L. Cook '03, Hewitt Crosby '03 and guest H. Crosby, Jr. (Purdue '39), Merton L. Emerson '04 with guest Robert Jackson (Yale '21), George N. Wheat '04, Ralph E. Tarbett '05, John C. Damon '05, Louis H. Tripp '06, Edward D. Merrill '09, David P. Allen '11 and guest A. Kirwan, Charles P. Kerr '11, Harold C. Mabbot '12, Frank L. Ahern '14, and Sarkis M. Bagdoyan '15.

Also, Horace M. Baxter '17, William C. Mehaffey '17, Louis J. Grayson '19, John Nolen, Jr., '20, Perry R. Taylor '21, George R. Hopkins '22 and guest J. F. Belair, William K. MacMahon '22, Robert K. Thulman '22, Edmund S. Pomykala '23, Paul J. Culhane '23, George D. Fife '24, George M. Tapley '24, Harry B. Swett '25, Galen A. Wallace '25, Walter G. Hodder '28, George D. Mock '28 with guest D. S. Bittinger, James G. Bowen '30, Henry E. Baratta '31, Mario V. Caputo '31, Henry D. Randall, Jr., '31, with guest Mr. Hobbs, Frederick M. Moss '32, Robert H. Macy '33, Utley W. Smith '35, David A. Werblin '36, John Lowe, III, '37, and guest Norman Moore, and Richard L. Steiner '39.

The Society held its annual ladies' night on April 19 at the Columbia Country Club. That is a mild way of saying we had one of the best annual ladies' nights ever celebrated in this area. Cocktails served at 7:00 P.M. preceded singing such as we did not know we could do, inspired by Harry Grant '00, our ladies' night chairman. "Down by the Old Mill Stream" — in honor of our speaker, Robert E. Rogers — "Shine on, Harvest Moon," "Take Me Back to Tech," "Smile the While," "O Tech, as I Look Back to Thee," "I've Been Working on the Railroad," "Let Me Call You Sweetheart," "A Stein Song," "Carry Me Back to Old Virginny," "Old Kentucky Home," and "Moonlight and Roses." Can you imagine M.I.T. men starting a dinner with a list like this, with the greatest gusto, to the accompaniment of Leon Brusiloff and his orchestra!

After an excellent chicken dinner, Ed Merrill '09, President, took the floor, making several introductions and reading President Compton's telegram regretting his inability to be present. In addition, he read a letter from our Past President, Edwin W. James '07, mailed from Panama on April 4. We were sorry neither could be with us.

Distinguished guests introduced included S. S. Steinberg, dean of the college of engineering of the University of Maryland; Anthony J. Scullen, dean of the school of engineering and architecture at the Catholic University of America; and Frederick M. Feiker, professorial lecturer on management at George Washington University. The introductions were followed by songs by the double quartet of the Apollo Club and by a beautiful exhibition of "Pushing the Damper In" by our live-wire Chairman Grant. Ed Merrill evidently felt that we should get down to business and gave a brief summary of vital dates for M.I.T. from the founding to the present, with figures as to comparative registration. He welcomed our guests, specifically mentioning the ladies, and introduced our first speaker, Merle Thorpe, editor of *Nation's Business*. Thorpe's anecdotes sneak up on you: Apparently, you are listening to a well-told funny story and suddenly you realize a parable has been put over in a way that only Thorpe has. His remarks on liberalism, what it is, democracy versus a republic, unemployment, unemployables, and tinkering with the machinery were duly appreciated.

Professor Rogers (Tubby to almost everyone present) told of a former professor at M.I.T., describing his "settlement work in the slums of English." Tubby reminisced from the days of old Rogers to the present. While it is human to become enthusiastic over the latest scientific developments, Tubby still likes his reading, 'riting, and 'rithmetic, and there seems to be much to be said for it. He voiced the question of where we are drifting, with the increasing emphasis on graduate work and the newest gadgets for atom smashing, and so on. While he misses the fumes from the old chemical laboratory in Rogers Building or the equally potent smoke from Dean Burton's cigars, we wonder if he was not coddling some of our old-timers a bit. At any rate, his detailed description of the old days and the changes that have occurred were duly appreciated by the assembled guests, and we are truly grateful for Tubby's trip to Washington. We hope he will come back again soon.

The following M.I.T. men with wives and/or sweethearts did not miss this most enjoyable meeting: George W. Stone '89, John G. Crane '90, James Swan '91, J. Earlston Thropp '94, Joseph W. Clary '96, Frederick A. Hunnewell '97, Proctor L. Dougherty '97, Charles H. Godbold '98, Lyman F. Hewins '98, William M. Corse '99, S. Franklin Gardner '00, Harry L. Grant '00, Henry C. Morris '00, Charles Bittinger '01, John Boyle, Jr., '01, W. Lorrain Cook '03, Hewitt Crosby '03, George N. Wheat '04, Amasa M. Hol-



1895 Continued

many warm friends in '95 who are grieved at his untimely death. After leaving Tech, he was associated with the life insurance business in several capacities. In 1898 he became the general agent for the Equitable Life Assurance Society of New York, for the district of western Massachusetts. His father was a prominent insurance man of Springfield, and Frederic established the Fuller Agency Company, of which he was president.

Recently our necrology records were revised to record the death of Ernest J. Flather, of 8 Berkeley Street, Nashua, N.H., on April 18, 1938. This information was received through a letter from Mrs. Flather. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

## 1896

Rockwell returned to Cambridge from his trip to his old home in Harriman, Tenn., and from his visit to the national wrestling championship meet at Champaign, Ill., but he failed to pick up any special items of news. He encountered a snowstorm in Tennessee, which was rather unusual, and he also had some correspondence with Billy McAlpine regarding McAlpine's work on waterways in Tennessee. — Billy Anderson has made his first trip of the calendar year to Boston, and Rockwell and Locke had a very pleasant evening dining with him on April 26. Billy is having a busy time with his real estate affairs in Cincinnati.

Word has been received that Arthur Baldwin has arrived in the United States from Paris, but up to the time these notes were written, at the end of April, he had not appeared in Boston to give his classmates an opportunity to see him.

Classmates may have noted in The Review reports of honors that have come to '96 men. Tozier has been made honorary president of the Technology Club of Lower Ontario, generally known as the Toronto Club. Joe Harrington was included in the list of Modern Pioneers who received awards from the National Association of Manufacturers. Joe's particular award was for inventions and development work instrumental in increasing the efficiency of combustion in furnaces and power plants.

Gene Hultman has had the distinction of having a ship named for him. On April 12, Dr. Compton christened the new shell of the M.I.T. crew the *Eugene C. Hultman*, and naturally Hultman was present to receive the honor. As chairman of the Metropolitan District Commission, Gene has been particularly helpful to M.I.T. in the student activities on the Charles River Basin. — The New York *Mirror* recently carried a story on the achievements of W. D. Coolidge, with an accompanying photograph.

Dave Beaman has received a well-earned advancement which means more freedom from his exacting duties of president and more leisure but which simultaneously gives him something to do when he feels so inclined: By vote of the

board of the New Bedford Gas and Edison Light Company on March 22, he was made chairman of the directors. He had been general manager from 1928 to 1933 and president for the seven years since 1933. Dave's history is rather typical of a number of men in '96 who are now coming to retiring age. He was one of a group of fellows from Ohio who had established relations with one another before entering Tech. After graduation he was, for a short time, with the Street Railway Company in Boston, but in 1897 he went to New Bedford, where he started in working clothes as company electrician. This job was followed successively by those of station superintendent, superintendent of the company in the electrical division, manager, general manager, and president. His progress was clearly due to his ability and to the satisfaction he gave to his employers in every job which he filled. He has seen the company expand until it is now nineteen times larger than it was in 1897. In that year there were 4,000 users of gas and electricity; today there are 76,000. To meet the increased demand, a modern powerhouse was built in 1917, and the plant has been enlarged several times since then. Prior to 1917 the company served only New Bedford and Fairhaven; today its lines extend to Plymouth and Cape Cod. Dave himself says that he has been looking forward to the time when he would be relieved of the responsibility of the presidential office. His request for retirement from active duty was submitted several weeks in advance of action by the board. He expresses himself as being very happy at the outcome, which will allow him to carry out some of his own personal plans and do things for which he had no time before.

H. S. Taft called on the Secretary on April 10, and it was most interesting to hear Taft's story of some of his doings and accomplishments during the past forty-odd years. At present he is retired and living in Providence, R.I., but retirement for him does not mean idleness. He has been trying to carry out some of his ideas and following up researches for which he did not have time while he was in active harness. He feels that his outstanding achievement among the many construction jobs which he put through successfully was the building of three dry docks at Norfolk, Va., for the United States Navy. On that job he did some things which it had been claimed could not be done, and at the same time he so expedited the work that the job was completed ahead of the time originally set.

A recent letter from Dan Richardson adds him to the list of '96 people who migrate south during the cold weather. He and Mrs. Richardson spent most of the winter with their daughter in Laredo, Texas, but when he wrote, at the end of March, they were waiting at the trailer camp in Sarasota, Fla., until New England's winter should be finished. They planned to leave Sarasota about April 20; if they did so, they escaped the heavy northeaster and snowstorm which descended upon New England on that day.

Dan says that even in Laredo the winter was unusual, with the first snow in eight years. His grandchildren there had never seen snow before. During the summers, from May to October, Dan and his wife run the Holiday Bungalows, which are located on automobile Route 3 on the shores of Lake Winnepesaukee, two miles north of Lakeport and one mile south of The Weirs. Their fifteen bungalows vary in size from one room to three rooms and are equipped for modern housekeeping. Their charges are \$1.25 a day a person. This information should be of great interest to classmates who may be motoring and seeking a good place to stop, where there will be not only fine facilities for motoring, bathing, and resting but also a congenial atmosphere and sociability with a member of your own Class.

Pneumonia was the immediate cause of the death of Fred Fuller on April 19; he had been in poor health for a long time. Fred was one of the leaders of our Class, and a further account of his life will appear in a later issue. — CHARLES E. LOCKE, *Secretary*, Room 8-219, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1897

Your Acting Secretary received the following message from our much interested member, Luzerne Cowles: "The recent necrologies of members of the Class have been somewhat disconcerting. The Review recorded three deaths in the November issue and five in the January issue. Add Hugh Moore and Arthur Elson, and the total is ten. At least three of these attended our fortieth reunion.

"How would it strike you to hold an interim reunion this June and not wait for the regular quinquennial normally scheduled for 1942? On the basis of ordinary expectations, we might reasonably anticipate more acceptances this year than two years hence. My idea would be to stage something simple, since many of us are getting to the pass where strenuous contests appear inadvisable. In fact, if we wait too long, a wheel-chair event might well be in order."

This matter was taken up with some members of the class executive committee, who decided to hold a meeting somewhere on the Cape, possibly at East Bay Lodge, Osterville. We hope that everybody will make a great effort to attend, thus increasing the enjoyment of the occasion.

We report with deep regret and sorrow the death of our beloved and enthusiastic classmate, Walter Spear, who passed away on March 29. His death was particularly distressing to me, as on February 24, I had received from him a chatty note. The New York *Herald Tribune* gave a very full and interesting account of his life and work: "Walter Evans Spear, chief engineer of the Board of Water Supply and builder of two mammoth water tunnels beneath the city, one eighteen miles long and the other twenty, died . . . at Beekman Street Hospital. He was sixty-five years old. Mr. Spear, who lived at 37

1897 Continued

Washington Square West, collapsed in his office. . . . For four years he had been engaged in directing the construction of the city's Delaware River supply system.

"He was born in Lawrence, Mass. . . . Before and during his college years he had worked on hydraulic engineering projects on vacations. After graduation he became assistant engineer of the Metropolitan Water Board of Massachusetts at Clinton. In 1900 Mr. Spear entered the office of John R. Freeman ['76], consulting engineer in Providence. Except for nine months in 1903, when he served with a commission surveying Long Island water supplies for New York, Mr. Spear remained with Mr. Freeman until 1906, when he became division engineer with the New York Board of Water Supply. . . . In 1909 and 1910 he was chief engineer of the Department of Water Supply in Brookline. In the latter year he started work on the system which was to bring Catskill water into New York and as department engineer, was in charge of the construction of that part of the aqueduct within the city limits. . . .

"During the World War, Mr. Spear held the rank of major in the Quartermaster's Corps and served as utilities officer at Camp Upton, and at the end of the war as constructing quartermaster in charge of all new construction. He went to Greece in 1920 as a representative of Ford, Bacon & Davis and made a survey of water supplies for Athens and Piraeus, which was closely followed in the system which was completed in 1931. Mr. Spear resumed his post as department engineer with the Board of Water Supply in March 1921, and the next year began work on the designs and contracts for City Tunnel No. 2, twenty miles long, which runs through the Bronx, Queens and Brooklyn. Mr. Spear became the board's acting chief engineer in 1933, and soon undertook the construction of the \$300,000,000 Delaware water supply system which includes three large reservoirs, one on Rondout Creek, one on Neversink River and one on the East Branch of the Delaware River. . . .

"Mr. Spear was a life member of the American Society of Civil Engineers and was a member of the American Water Works Association, the New England Water Works Association, the Municipal Engineers, of the City of New York, the Boston Society of Civil Engineers, the Engineers' Club and the Arkwright Club. His wife, Mrs. Elise Logan Spear, and a son, Walter Evans Spear, Jr. survive."

The following clipping, also from the *Herald Tribune*, shows the very great esteem in which he was held and the prominence of his position in New York City: "More than 600 persons including many city officials attended funeral services for Walter Evans Spear . . . at the Protestant Episcopal Church of the Transfiguration (The Little Church Around the Corner), 1 East Twenty-ninth Street. . . . The Rev. Dr. Randolph Ray, rector of the church, officiated at the services. He was assisted by the Rev. John E. Gerstenberg, rector of the Protestant Episcopal Church of the Redeemer,

Merrick, L.I. of which Mr. Spear was a vestryman. Among those attending the services were Newbold Morris, president of the City Council; Joseph Goodman, Commissioner of the Department of Water Supply, Gas and Electricity; George J. Gillespie, president of the Board of Water Supply, and Henry Hesterberg, a member of the board."

Now just a word from our old friend Hopkins, who, I am glad to be able to state from very recent correspondence, is in much better health than formerly: "When I brought my sick wife to Wellfleet in March, 1937, in the hope that the mild climate would be helpful to her, I expected that she might linger for a year or two and that I should be her nurse and companion. In three days she was gone, and I was a desolate mortal in this birthplace and home of my childhood. . . . I talked with the good doctor and the parson and got a list of shut ins — the most interesting ones — and began to call on them and take those that I could for a ride. Soon I had a lot of other people's worries in my mind and could begin to forget some of my own."

"Then I started trying to find a few houses to sell and soon was doing a little real estate business. Every house I sold made a friend, and soon I could get cups of tea and have chats in several houses every afternoon. A little campaign to raise money for the school band brought some more friends. . . . Now I count among my friends several musicians, half a dozen writers, a dozen retired business people, most of the children in town, and a lot of nice old ladies and men. My greatest difficulty is to keep from doing too much. My last adventure was to spend a couple of weeks in a hospital bed to rest up, followed by two more at my daughter's home, and now two more down here at the Cape, most in bed, as I have a too rapid heart. Several classmates were so kind as to call on me at the hospital."

We report with deep sorrow the sudden death of Arthur Elson, whom the writer knew very intimately. He lived with his mother at 114 The Fenway, Boston, as he never married. We shall miss him from our class gatherings, which he regularly attended. The *Boston Globe* of February 25 told of his life and work: "Arthur Elson, 66, Boston music critic and son of the author of Elson's Music Dictionary, died suddenly yesterday in a New York hotel. . . . Author of critical works on music widely read and republished many times, Elson was a graduate of Harvard College with the class of 1895. He was the son of Louis Charles and Bertha (Lissner) Elson. After attending Roxbury Latin School and later after studying at Massachusetts Institute of Technology, Elson worked for the Norwich Bleachery and various dyestuffs concerns and finally taught at George School of Technology and at M.I.T."

"But the call of music was too great. Son of the great musical theorist of the New England Conservatory, Elson slipped from private school teaching into writing and recommended in his Harvard 25th class report that his articles be read 'as

a cure for insomnia.' Elson never married. He devoted the rest of his career to teaching and to music and was the author of many music guides, critical treatises on the opera and works dealing with composers. Elson was a member of the Rockport Historical Society, Guild of Boston Artists, Rockport Art Association, University, Boston Authors, Boston Chess and Harvard Club of Boston, as well as the American Chemical Society. Among Elson's closest survivors is his uncle, Alfred Walter Elson of Belmont, noted printer and art publisher, now nearly 81 years old."

In the last issue in which '97 notes appeared, I mentioned the fact that Arthur Hopkins was going to get some information on W. O. Sawtelle. We will all remember Billy Sawtelle for his warm-heartedness and for his sharpness of wit. The last time I recall having seen him was at one of our outings at the Cape. We got him to act as auctioneer of all the old baseball and golf equipment which was left over from the outing, and he certainly did a wonderful piece of work. As regards his lifework, I quote from the resolution made by the Franklin Institute of the State of Pennsylvania, sent me by Arthur Hopkins through the courtesy of his friend: "The Committee on Science and the Arts of the Franklin Institute records with sincere regret the death of its valued and loyal member, William Otis Sawtelle, on September 22, 1939, at his home in Haverford, Pennsylvania. Dr. Sawtelle was elected a member of the Franklin Institute in 1919 and a member of the Committee on Science and the Arts in 1923, upon which Committee he served continuously until his death."

"Dr. Sawtelle was born in Bangor, Maine, on July 7, 1874. He received his Bachelor of Science degree in 1899 from the Massachusetts Institute of Technology and his Master of Arts degree from Harvard in 1907. He was instructor in physics at the Massachusetts Institute of Technology from 1903 to 1905 and assistant at Harvard in 1912-1913. He went to Haverford College as instructor in physics in 1913 and although his connection with the College was for a few years only he made so many friends in that community that he continued his residence in Haverford. In 1917-1918 he was acting professor of physics at Swarthmore College. In 1918 he was assistant physicist at the Bureau of Standards. He was for a time a trustee and secretary of the Wagner Free Institute of Philadelphia. He was the author of a number of papers in the field of physics and was particularly known for his study of the spark discharge, which was an investigation of the nature of the oscillatory spark in air at atmospheric pressure. . . .

"For the past twenty years Dr. Sawtelle has turned his attention to historical research, chiefly in connection with the Cranberry Islands and Mount Desert Island, Maine. He gathered together the material in the Islesboro Collection, a remarkable historical museum housed on his own estate on Little Cranberry Island. This collection will now be taken



1897 Continued

over and managed by the State of Maine. It was a proud moment when, in recognition of his historical work, the University of Maine, in 1933, honored him with the degree of LL.D. By his death the members of the Committee on Science and the Arts have lost a warm-hearted, courageous and helpful friend. His scholarly attainments and sharpness of wit made him a delightful companion and a valued member of the community in which he worked."

John Collins, assistant plant manager of the Arlington Mills, wrote that the mills recently had a banquet and entertainment in honor of the seventy-fifth anniversary of the organization. In the 1889 notes you will find some remarks made on that occasion by Franklin W. Hobbs, President.

After receiving a most disconcerting number of notices of deaths of different members of our Class, it was especially pleasing to receive a personal letter, unsolicited, from our old friend Achilles H. Pugh of Cincinnati, enclosing a clipping from a Cincinnati paper showing his picture, which represents him as looking about the same as he did forty years ago. He is dressed in his military uniform and looks full of life and animation. The clipping read as follows: "The promotion of Lieut. Col. Achilles H. Pugh to colonel in the Ordnance Department, Officers' Reserve Corps, was announced . . . by Major Fred A. McMahon, executive officer of the Cincinnati Ordnance District. Col. Pugh is president of the A. H. Pugh Printing Co. and resides at 1820 Dexter Avenue, Walnut Hills. During the World War he was head of the loading and explosive section, Cincinnati Ordnance District, comprising eight states. Following the signing of the armistice, he served on the claims board which settled terminated contracts amounting to \$100,000,000. He was commissioned lieutenant colonel in the Officers' Reserve Corps in 1922."

As a final note I want to quote a letter which I received from Wilfred Bancroft, former Class President, to whom I wrote asking him to give an account of himself for The Review: "Your appealing letter would have galvanized into action a wooden cigar Indian, and it had the same effect upon me. I have been busy every minute since your letter came, trying to solve the problem: What does the Indian do after he is galvanized? I have not found the answer. So I go round and round, trying to decide what this Indian should do. The problem would have been simple were it not for Washington's Birthday. With the example of the Father of our Country so much before me, I am stumped—I cannot tell a lie, I cannot invent news."

"We are living in Haverford, Pa., and I am treasurer of the Lanston Monotype Machine Company. My job keeps me in Philadelphia. Unfortunately, I scarcely ever get to Boston and so I do not get the advantage of the broadening influence of which you speak. I wish that I did see you oftener, for you are always stimulating and are one of the finest examples

of 'broadening' I know. So, dear Charles, I am no help to you so far as the subject of your letter is concerned, but I do send to you and my classmates my affectionate regards." — We all sincerely hope that Wilfred will be able to take time off to be with us at our June meeting somewhere on the Cape. — JOHN A. COLLINS, JR., Secretary, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, Acting Secretary, 30 Kilby Street, Boston, Mass.

## 1898

The local members of our Class had a get-together on March 29 in the Silver Room of Walker Memorial. Our guest of honor was Paul Johnson of Altadena, Calif., who had come East on business. Also present were Henry Scott, Joe Riley, George Cottle, De Kay Thompson, Fred Dawes, Henry Sullivan, Elliot Barker, Ernest Bragg, Bob Draper, Arthur Blanchard; and Miles Sherrill '99 was with us. As guests we had three '98 sons: Kenneth Barker, Robert Dawes, and Ernest Bragg, Jr. Kenneth Barker is following in his father's footsteps as a chemist and has recently joined the staff of Arthur D. Little, Inc. Robert Dawes is a successful manufacturer, and his factory is in his home town, Hudson, Mass. He showed some films of a recent cruise to South America, including scenes with his little daughter toddling about the deck. He showed also some remarkable shots of a waterspout which his ship avoided only by changing its course. Ernest Bragg, Jr., is studying for a master's degree in biology at Boston University and is registered to enter the Medical School next year. "Speaking of grandchildren," Bragg's older boy, Leslie, has three children. We recall that he was on the instructing staff at Tech from 1927 to 1932. He is now in Trinidad installing an oil-distilling plant.

George Cottle brought his motion-picture projector and first showed a film taken by Paul Johnson at the big Tech reunion of 1925 at Fort Warren on George's Island in the Boston Harbor. It was good to see Roy Peavey and Seth Humphrey in action in the film, as well as many who are still with us. Then, after Robert Dawes's pictures, Cottle showed his own films taken on a western trip last summer. Many of George's friends claim that his pictures and the talks with which he accompanies them excell those of the professional travel lecturers. At the end he had a few shots of last autumn's foliage in our own Milton Blue Hills, just to show that there are no more beautiful scenes anywhere in the world than right here around Boston. — Ed Chapin, in his message of regret that he could not come, sent this news of '98: Charlie Winslow participated in "Town Meeting of the Air" recently; Henry Scott has retired from the engineering game but keeps busy and happy looking after the investments of the Framingham Co-operative Bank. He spends his summers at Falmouth, Mass., much of the time on his yacht. — ARTHUR A. BLANCHARD, Secretary, Room 4-160, M.I.T., Cambridge, Mass.

## 1900

Henry V. Hubbard, who has been a member of the Harvard faculty since 1906 and will become professor emeritus on September 1, was the subject of a sketch in the Taunton *Gazette* of March 23. — The April Review carried an account of a Modern Pioneer award from the National Association of Manufacturers to Carleton Ellis as one of the country's outstanding workers in chemical research. Carl recently built a new home, "Coral Harbour," in Nassau, where he spent the winter.

Notice has been received of the death of Darwin Ulke, VI, on March 25, 1939, at San Leandro, Calif.

Who should drop into the sanctum recently but Hart, Vice-President and Treasurer of the Shawinigan Water and Power Company of Canada. Bill promised to attend the reunion next week if he could arrange a business trip at that time. Long time no see, make it more often, seemed to be the sense of the meeting. — One of the best local class gatherings took place on April 23 at the University Club. Jim Patch had his films of the last three reunions and ran them off forward and backward. It was very interesting to see the boys as they were in previous years. At this meeting the members voted to apply some of the class funds to the allotment of \$15 "scholarships" to classmates who, through lack of funds, would be prevented from attending the reunion. The Secretary is the only one to know the recipients of the scholarships. Those attending the dinner were Bugbee, Richardson, Brock, Westcoat, Jackson, Ziegler, Newhall, Russell, Davis, Lawley, Stearns, Patch, Fitch, Leary, Allen, Crowell, Draper, Burns, Charlie Smith, Silverman, Ingalls, and the Secretary.

Recent changes of address: Henry M. Brock, St. Robert's Hall, Pomfret Center, Conn.; Mortimer Silverman, 313 Summit Avenue, Brookline, Mass.; Sheldon D. Graff, 36 Rockledge Road, Newton Highlands, Mass.; Homer Littlefield, 131 Henderson Road, Columbus, Ohio; James G. Macdonald, 43 Bowdoin Avenue, Dorchester, Mass. — C. BURTON COTTING, Secretary, 111 Devonshire Street, Boston, Mass.

## 1901

The New York *Herald Tribune* for February 5 made some very interesting comments on the annual report of E. I. du Pont de Nemours and Company. Lammot du Pont, President of the company was quoted as specifically stating in the report that prices of the company's products averaged 3 per cent lower in 1939 than in 1938, but that in contrast the company's wage rates averaged 3 per cent higher and at the end of the year were 7 per cent higher than at the end of 1938. The Du Pont Company, it was pointed out, was not seeking war profits; since 1936 its efforts to sell military explosives in foreign countries have been entirely discontinued. Instead, the report stated that the company has continued its policy of extending and bettering its domestic

## 1901 Continued

manufacturing facilities and that in 1939 approximately \$27,700,000 were expended in plant construction. The report also indicated that very special attention is given by the Du Pont Company to the welfare of its employees and that no change has been made because of any Federal benefits which may be expected from the national government.

Undoubtedly, annual reports of other corporations would show that the members of our Class are doing their part in the improvement of business and living conditions in these United States. If any member of the Class happens to run across references to such reports which would prove of interest to the rest of us, please advise your Secretary thereof, so that appropriate comments may be made in these notes.

Usually, comments received from our classmates are all too brief and generally just state present affiliations. For example, J. P. Catlin, VI, gives his address as 501 Fifth Avenue, New York, and notes only that he is vice-president of the Wood Newspaper Machinery Corporation of Plainfield, N. J. Naturally, that is good news but regrettably brief. — A. Rosecrans Baldwin, II, was somewhat more informative in giving his address, 1224 Astor Street, Chicago, for he stated in addition that he recently retired as vice-president of Tenak Products, Inc., of Chicago as a consequence of a nervous breakdown. In as much as he indicated that he was then recovering at the Milwaukee Sanitarium of Wauwatosa, Wis., we trust that he is now again in perfect health and that we shall see him at our fortieth reunion. — Bob White, VI, who has been more or less retired for some time, is apparently continuing his travels; the last post card we received from him was from Fort Myers, Fla. Bob has been quite a regular attendant at the Alumni Day dinners in June of each year, and we hope to see him again this year. — Stuart Miller, X, another retired classmate, very briefly gave his present address as 209 East Arch Street, Marquette, Mich. — Leon E. Crouch, I, is now located at West Warren, Mass., and Charles A. Record, II, is at 7 Brewster Terrace, Boston.

Lonny Isham is now, we are glad to state, becoming somewhat of a regular correspondent. At the present time he is working on a special furnace for the production of metal-alloy castings to suit the needs of the particular work demanded or to suit particular specifications. If everything works out all right, the operations will include heat treatment. Lon believes it is an open field and that the development of such work by men of long experience and training should prove more valuable and efficient than if carried on by youngsters of less than forty.

Since the class notes were prepared for the May Review, your Secretary has become reasonably well established in Portland, Maine, and is finding the change of headquarters worth while and future prospects encouraging. If any of the boys decide to take their vacations in Maine rather than in Florida, or if

they have occasion to come to Maine for business or other reasons, we trust that they will look us up here at our office in the Chapman Building.

We greatly regret to announce the death of Philip L. Buxton, X, on March 24. Phil was president of the Buxton Scrap Iron Company of Worcester, Mass. He died after a short illness at his home in that city. He was a native of Worcester, and after spending three years at M.I.T., left college to enter the business of his father, who was then head of the Perry, Buxton, Doane Company. Later, Phil became a partner and eventually formed his own company. He was active in church and civic affairs and belonged to a number of clubs and fraternal organizations. He leaves only his widow, Mrs. Winifred Robertson Buxton. — ROGER W. WIGHT, *Secretary*, The Travelers Fire Insurance Company, Chapman Building, Portland, Maine. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

## 1902

Francis Deane Avery, another of our classmates who returned with us to the Oyster Harbors reunion, died on March 6. At the time of his death, Avery was living in his home town, Greenfield, Mass., but in the early years after his graduation he was in railroad work with the New York Central. At various times he made his headquarters in Buffalo, Rochester, Watertown, and Richland in New York State, serving in various engineering capacities from 1902 to 1917. In 1917 he returned to Greenfield and entered the engineering business as a member of the firm of Schneck and Avery, and from 1920 on, under his own name.

He always took an active interest in the local affairs, and his place in the community life is well given in the following quotation from the *Greenfield Recorder-Gazette*: "The report of the Greenfield finance committee now in the hands of town meeting members, stands as a final public service contribution by its chairman, F. Deane Avery. Looking back through his life, and more particularly through the years since 1917 which he spent in Greenfield one finds many other splendid contributions. Some of these were municipal. As the son of a distinguished Buckland town father who also served as county commissioner, Deane Avery was early imbued with conviction that democracy rests on the willingness of citizens to serve in the posts to which their fellows call them. . . . He recognized, also, another fundamental of democracy; that citizens should contribute of their knowledge and experience to deciding current problems. . . . The father of four, he was unflagging in his interested helpfulness to young people. He was almost a perpetual father counselor to the DeMolay boys, was a leader in giving Boy Scouts adequate camp facilities and, through the Kiwanis club, made other contributions to youth. An M.I.T. graduate with broad engineering experience as a railroad man before returning to Franklin county, Deane Avery's friends

sometimes preferred to think of him in the more venerable role of surveyor. He took more than a professional interest in tracing back the deeds of some property to the work of a predecessor in the field and was prompt to praise the product of some of the pioneers, lacking though they did the training and equipment that was his. . . . A few years ago he wrote 'An Addendum, Explaining the Map Showing the Grants' which was an important addition to the new History of Buckland. His office was a treasury of data and drawings often exceeding the information available at the country registry on some obscure corner. Greenfield thus finds much cause to regret the untimely passing of this man. The nature of his work and public gifts was such, however, that he created what will be an enduring memory among his townspeople." — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

## 1903

Four members of the Class have died during recent months: The death of Edwin G. Goodwin, III, on November 1 in Knoxville, Tenn., was the result of a stroke caused by high blood pressure. Goodwin had been in the employ of the Southern Railway System for almost thirty years, serving for the past twenty as fuel agent for the entire system. Between 1903 and 1910, he was connected with various mining concerns in Mexico, Canada, and Colorado. He was married in 1905 to Rebecca C. Headden of Kansas City, Mo., who died in 1939. They had no children.

Daniel S. Wilson, VI, died on February 6. He was at one time with Stone and Webster in Boston, and had attended several recent reunions. We hope to have further information later. — Mary Snow, VII, who died on April 4, lived in Wellesley, Mass., the last we knew and at one time ran a tearoom there. Further information may be available later. — John Ross Bates, I, died on March 12 in Cranford, N.J. For many years he was with the Whitney Crane Company and for the past nine years he was New York district sales manager for the Shaw Box Crane and Hoist division of Manning, Maxwell and Moore, Inc. Two years after graduation he became associated with Wonham and Magoe. Later he helped found the firm of Wonham, Bates and Good, commercial and exporting engineers.

An informal dinner was held at Walker Memorial on April 25, with about twelve men from Boston and suburbs attending. A class dinner is scheduled in Boston on June 1, the Saturday night preceding Alumni Day. If you are in Boston this week end, check with the Secretaries as to time and place in case you did not receive a notice. Two of the Class from points farther away than those to which notices had been sent unexpectedly appeared last Alumni Day, not knowing about the class affair the Saturday before. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.



## 1907

In the April Review the death of John P. Chadwick was reported. Through Henry Martin of New York, I learned that Mrs. Chadwick was scheduled to arrive at Pier 7, North River, New York City, on the *Santa Lucia* of the Grace Line on March 19. I therefore wrote to her at that address a note expressing personal and class sympathy. She replied on April 5, on the stationery of the Hotel Blackstone, 50 East 58th Street, New York City: "I wish to thank you very much for your kind letter about John; I know that he would have appreciated your expression of sympathy to me. I can't seem to become resigned at all to losing him — he was such an unusually fine person, a wonderful husband and father, and the shock seems almost too much to bear. Thank you again."

When I wrote in the April Review of Dick Woodbridge and his Modern Pioneers award, I did not know that John Frank, President of Ilg Electric Ventilating Company, had been similarly honored at the Chicago Modern Pioneers celebration on February 20. John's award was for the invention of the propeller-fan type steam unit heater which his company pioneered in 1916 and which is now generally used everywhere for heating of factories, garages, stores, offices, and so on. John was also a member of the sponsoring committee for this event.

On March 23, Harry Moody thoughtfully telephoned me at my home. He and his wife were spending the Easter week end with his aunt in one of the Boston suburbs. He is still associated with Stevenson, Jordan and Harrison, management engineers, with offices in New York and Cleveland, and lives at the Scarsdale Manor Apartments, Scarsdale, N.Y. His son, Bob '34, is with General Motors in Detroit. — Alexander Hamilton Van-Keuren, United States Naval Academy man, associated with our Class in Course XIII-A during our senior year, is now rear admiral, Bureau of Construction and Repair, United States Navy, Washington, D.C.

Upon receiving from the Alumni Office notice of a change of address for Frederic B. Schmidt from Evanston, Ill., to Elgin Academy, Elgin, Ill., I wrote him, suggesting that a letter telling of his present work would be most welcome. With fine co-operation he wrote me on April 15. From 1907 to 1923 Fred was associated with several architectural firms and in the latter year opened his own office. He has a daughter, Henrietta Elizabeth, and a son, Frederick Potter. His letter follows: "... On the first of July, 1939, I accepted a position as business manager of Elgin Academy at Elgin, Ill. This institution was granted a state charter in 1839 and has been in continuous operation as an academy since 1856. The campus is about the size of three city blocks and has around fifteen buildings and houses. One of them, the Sears Fine Arts Building, houses a collection of approximately 250 paintings and has five galleries, one of which is purported to contain the

finest collection of early American art in the United States, including one of the two original Gilbert Stuart paintings of Washington at Dorchester. . . . The school has approximately 150 students, and covers seventh and eighth grades, high school, and two years of junior college. There are both boys and girls at the academy, with boarding facilities for boys. . . . I am taking care of all the maintenance work of the entire academy and have just completed a set of drawings for a new social center and dormitory to be known as Sears Hall. . . . In order to take this position, I severed my connections as clerk of the vestry of St. Luke's Church in Evanston, as chairman of the building and grounds committee of the Evanston Boy Scout Council, and as a member of District 76 School Board. Mrs. Schmidt and I established our residence at Elgin Academy the first of last October. We have two children: Betty was graduated from Cornell College at Mount Vernon, Iowa, in 1937, majoring in art. The next year she spent at the Art Institute in Chicago and the following year took a course in education at Northwestern University and a half year more at the Art Institute. Last summer she was head of arts and crafts at College Camp, Williams Bay, Lake Geneva, Wis., and she is assistant to the professor of art at Cornell College, the school from which she was graduated. She is not married. In 1939 our son, Bud, was also graduated from Cornell College. He majored in biology and geology, and his ambition is to become an oil geologist. He has recently procured a position with the Southern Bell Telephone Company of Houston, Texas. I . . . should appreciate your extending my regards to all the members of the Class. . . ."

In closing, the Secretary urges you to be on hand in Cambridge this Monday, June 3, Alumni Day, and at the banquet at the Hotel Statler, Boston, in the evening. *Please note* that reservation has been made at the Statler for a private room for the use of '07 men from 5:00 p.m. until the hour of the banquet on June 3. The room number will be posted in the hotel lobby. Take advantage of this opportunity for sociability with your classmates. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

Our New York spring luncheon was held at the Technology Club on April 13, with F. Alexander Magoun '18, Associate Professor of Humanics at M.I.T., as the guest speaker. His subject was "The Art of Human Relations for Engineers." Paul Wiswall, reporting on this meeting, writes: "Our class luncheon here in New York was graced by the crown princes of the families of our President and Secretary: Carl Gram, Jr., and Sam Main, and I thought they did a superb job of pinch-hitting for their respective dads. Molly Scharff acted as their host. As far as I could see, they were enjoying themselves.

The speaker of the occasion certainly talked up their alley as well as up ours. We had the pleasure of listening to F. Alexander Magoun, who started as a mechanical engineer, became a naval architect, if you can believe the records, and now devotes all his time to his courses in humanics. That's a big word for me to try to define. But in simple language, Professor Magoun is one of those lucky men who earn their living riding their pet hobbies. His I might define as 'how to get along with people: your sweetheart, your boss, your wife, your superiors, and your inferiors, in and out of the office, including, presumably, the census enumerator and the income-tax investigator.' . . ."

"There were fifteen of us to listen to Professor Magoun. Several of the regulars were away, and we missed them. John Mills is still confined to his room, though he can now get into a perpendicular position for thirty minutes twice a day. There is, however, nothing wrong with John's spirit, and he is on the up-and-up. Somebody, in consulting the Senior Portfolio, discovered that we were celebrating John's birthday in gathering for this luncheon, and a properly congratulatory telegram was sent to him. Molly Scharff, his wife, and your local Secretary attended a remarkable demonstration of sound reproduction at Carnegie Hall the other night, thanks to John. The Bell Laboratories had set up apparatus behind a curtain on which beautiful color effects were reproduced. In the darkened auditorium, we listened to magnificent music, both orchestral and vocal, all reproduced by apparatus developed in the Bell Labs. Poor John! He could not attend the concert with which he had had a great deal to do. Frank B. Jewett '03, President of the Alumni Association, was the presiding officer. Maybe the happiest event at the luncheon was the sight of Benny Dow going upstairs two steps at a time. Ben admitted he had made a complete recovery from his tough experience of last summer.

"After the luncheon, I went to the Grolier Club to see some of the outstanding typographical work of D. B. Updike and his Merrymount Press. One of the exhibits took me back to Tech, for there were the lists of the donors of the dinghy fleet and the contributors to the sailing pavilion. Among the '09 names that I recall were those of Jim Critchett, Delos Haynes, Ed Ryerson, and Joseph L. Richards. Delos was in the East and hoped to be at the lunch but was called to Boston. He is preparing, by the way, an account of his trip this winter to New Mexico.

From Carl Gram, I learn that his two daughters, Alberta and Gloria, took part in several numbers of the Boston Skating Club's carnival held in March. Alberta continues with her music, and on March 16 sang several German, French, Italian, and English songs at the meeting of the Copley Society, Boston. Carl, Jr., who is now located in New York, participated in the New York Skating Carnival held in Madison Square Garden in March.

1909 Continued

Molly Scharff writes: "I attended the spring convention of the American Society of Civil Engineers in Kansas City, Mo., April 17, and had lunch with Harry Havens and Harry Rapelye '08. Both of them seemed well and prosperous. Harry Havens asked particularly to be remembered to you and other members of the Class. He told me, by the way, that he has a son in the Class of 1940 at M.I.T. The boy was operated on recently for appendicitis, but was getting on very well when I saw his father. . . . This reminds me, my son Samuel is a member of the freshman class and makes me wonder whether anybody has ever compiled a list of the sons and/or daughters of 1909 men who have gone to the Institute. . . ." Your Secretary has been away so much since the receipt of Molly's letter that he has not had time to follow up the suggestion about our sons and daughters but will endeavor to have such a list prepared for publication in the fall.

From the Chicago *Daily News* we learned that Ed Ryerson was one of the speakers at the National Forum held at the Palmer House in Chicago in March. His topic was "Industry and Individuals." This was part of a program on "Industry and Science—Institutions of Peace." Ed is not only very active in his own business but is connected with pretty nearly every important organization in Chicago. In addition to being a director in several large companies in Chicago as well as New York, he is a trustee of the University of Chicago and was recently made a citizen fellow of the Institute of Medicine of Chicago. He is also a fellow of the Yale University Corporation. In 1932 the University of Chicago awarded him the Rosenberger Medal for outstanding work in social welfare, and the Benjamin J. Rosenthal Charities, Inc., presented him with a Rosenthal Medal in 1935.

Rudolph W. Riefkohl, lieutenant colonel, United States Army, is now at Camp Paraiso at Panama Canal Zone. — It is with regret that we announce the death on April 23 of Clifton G. Gilpatrick, who was a special student in architecture during our senior year. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

## 1911

Who says thirteen is unlucky? In late March, shortly after this year's early Easter, your Secretary was stricken suddenly with pneumonia and taken to Worcester Memorial Hospital. With the sulfapyridine treatment and fine care, I was able to leave the hospital in thirteen days and then after thirteen days of convalescence under the watchful care of my wife, I was back on the job on April 23 just in time to prepare these notes.

I regret to have to record the death of another classmate: On April 12, Philip S. Avery, IV, died at his Brookline home. He had been a practicing architect at 69 Newbury, near the old Rogers Building, but had never taken an active interest in class affairs.

Emmons Whitcomb, X, New England manager for United Airlines, started on Patriots' Day for a southern cruise, the first vacation he has taken for a number of years. — Fred Daniels, VI, and I were members of the general committee — he in charge of the reception committee, and I in charge of registration and entertainment features — for the 1940 spring meeting of the American Society of Mechanical Engineers, held on the first three days of May in Worcester.

Address changes from the Alumni Office indicate that Nate Levy, I, is back with the sewerage department of the Metropolitan District Commission in Boston. Franklin Osborn, 2d, III, has returned to the States for a while from his duties with the Andes Copper Mining Company in Chile, S.A., his home now being on Walnut Road, East of Main, R.D. 3, Vineland, N.J. Ralph E. Sawyer, XII, formerly with the Public Works Administration staff in Concord, N.H., is now at 32 Love Lane, Kittery, Maine. And Sumner C. Willis, I, has left Dorchester and is at 825 Mountain Avenue, Westfield, N.J.

Having for many years favored the Alumni Fund plan as practiced successfully at many leading colleges, it is particularly pleasing to me to see the plan adopted by a twenty-to-one vote of our Alumni. I hope you all have read Frank Jewett's ['03] message and the accompanying explanatory booklet sent out in mid-April, for I am sure you will be 100 per cent sold on the substitution of "The M.I.T. Alumni Fund," effective July 1, for the current dues solicitation. The selection of Chick Kane '24 — only a few years older than your Secretary was when he spent five years on the Alumni Association staff in the mid-Twenties — as fund director is an admirable one, and in his capable hands, I am confident the success of the venture is assured. I urge all classmates to support the fund to their utmost yearly.

We'll be looking for you, Jack and I, at the Institute next week, June 3, throughout the day but particularly at lunchtime and at Hotel Statler that evening. Don't fail us! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

A letter has just been received from the Institute Library asking that any member of the Class who has written a publication or book contribute a copy that can be placed in the Technology collection. Hope our authors will come forward, as at the present time the 1912 section is practically bare. — A. P. Hornor, beginning on March 25, assumed the duties of vice-president and division manager of the Ediphone department of Thomas A. Edison, Inc. This change in position was announced to the Edison employees in a notice which read in part: ". . . Mr. Hornor joined the Edison group of industries in 1925 as manager of the E-K Medical Gas Laboratories, Inc., a venture of Charles Edison ['13]. This business has

grown from nothing in 1925 to what is now a profitable enterprise. About a year ago it was purchased by Thomas A. Edison, Inc., and Mr. Hornor became a vice-president of Thomas A. Edison, Inc., and manager of the E-K Medical Gas division. Mr. Hornor is a graduate of M.I.T. . . . and prior to his association with Edison Industries was employed in various fields, such as street railway, woodworking, textile, construction, and life insurance."

Through the kindness of C. B. Vaughan, II, we have learned of the fairly recent appointment of David Dasso, II, to the post of secretary of the treasury of Peru. And that's all we know about it at this writing. We have dispatched a hurry call to Dave himself for some details for this column. We don't seem to have so many members of this Class in prominent public office that we can afford to miss anything. Vaughan, as most of you know, is connected with Sulzer Brothers, Ltd., representing the Swiss firm of that name in this country. His office is at 50 Church Street, New York City.

Over a period of several years we have built up a list of some forty-three names of classmates reported to be located in the New York metropolitan area. Recently we sent a return post-card notice to the last known address of each one, requesting verification or correction. Only twenty-five returns were received, the rest apparently being sunk without trace. A luncheon meeting in New York for those who can spare an hour or so is planned for some day in the very near future.

To Erwin H. Schell, an acknowledgment and thanks for an autographed copy of his booklet, "Design for a Career." This little volume, a privately printed edition, contains a selection of some of Schell's letters written to his former students. Those of you who have ever had an opportunity to read any of this series of letters do not need to be told what an inspiring job Professor Schell is doing. Our congratulations, Professor. — Word has just been received of the promotion of Commander Phil Lauman, United States Navy, who now ranks as captain of the Naval Construction Corps. His home address is 924 Paxton Street, Danville, Va. Lauman was previously stationed at the Portsmouth, N.H., Navy Yard for some time. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N.Y.

## 1913

Charles Edison, IX, continues to be much written about in the newspapers. Of his intention to run for governor of New Jersey, the *New York Times* said on March 24: "When the present Secretary of the Navy took his seat in the Cabinet a few months ago, Mayor Frank Hague of Jersey City expressed disappointment. The Democratic organization of New Jersey, he said, had been deprived of an excellent candidate for the Governorship."



1913 Continued

Last week the 49 year old Secretary, Charles Edison, announced that he would run for Governor. He added that he would not consider resigning until after the primary on May 21; his nomination seemed assured. Meanwhile the Secretary would attend the navy's manoeuvres and inspect defenses on the coast. It will be Mr. Edison's first candidacy for an elective office, but he has had considerable experience in public affairs. Formerly a 'liberal Republican', Mr. Edison has been a New Deal adherent since the beginning of the Roosevelt administration. He served as New Jersey director of the National Emergency Council and as a member of the Regional Labor Board. Son of Thomas Alva Edison, the inventor, he studied engineering at M.I.T., went into his father's business, and at 33 was in executive command of the Edison interests. He fishes, yachts, plays golf and the piano, collects books, and is expert at skeet shooting."

Ed Cameron, I, who was really funny in his antics at our dinner at Salem, writes: "Everything is fine; thanks for the inquiry. The past was good, the present is better, and the future, of course, will depend on how well those who write the specifications for the consulting engineer's heaven do their job. I've written many specifications and built too many more; so here are a few tips for them. Heaven, naturally, will be in New England but with its climate refined to the decency of Tennessee's. It will be five miles in diameter — no more. On the periphery will be located the palatial mansions of worthy engineers, with the corner lots reserved for 1913 veterans. At the center will be sites for dams, power plants, office buildings, transmission lines, factories, sewer lines, and all the other interesting jobs we have, heretofore, had to travel from Maine to Texas to build. Thus the celestial engineer may kiss his wife good-by in the morning, come home to lunch to check up on things — I forgot, this is supposed to be heaven — anyway, he can see his family twice a day, instead of once a month or twice a year as happened to me on a recent job.

"Lots of bothersome things will be omitted: stop lights, bills for junior's first semester, technical papers, monthly estimates, progress schedules, budgets, ash trays, hooks, slices, and sand traps. There'll be ringside seats to the other place, so we can see 'em fry: Hitler, Stalin, and certain guys that *you* know who won't pay their class dues and that I know who collect them. (Send along the bill, Fred.) I know there'll be special problems as to eyeglasses, ear trumpets, false teeth, and other accessories that some of us elderly vertebrates have accumulated in a quarter of a century; at least a discreet inventory of several friends of 1913 age leads me to believe this. The ultimate problem will be to distinguish between the original members and the replacement parts. Who can swear to the original inventory? So heaven will start with stainless-steel parts for all. . . . It is unnecessary to add

that I do not expect to attain this fine heaven myself; my misdeeds are too many. Those on record, in the order of occurrence for the past six years, include a sewer and pumping plant in Massachusetts; studies with some construction for drug and candy factories in Memphis, Tenn.; flood protection and power work and district steam line in Holyoke, Mass.; valuation work in Chattanooga, Tenn.; power work in New Jersey; and now valuation for a while here in Allentown, Pa."

Howard Sutter wrote on the letterhead of the Federal Works Agency, Public Roads Administration, Fort Worth, Texas: "I was very much pleased to hear from you again after so many years, as I have lost all trace of most of our classmates. I did belong to an M.I.T. club in Kansas City for several years and met a good many M.I.T. men but never any of the Class of '13. After leaving Tech, I worked in Maine and North Carolina, then enlisted in the United States air service during the World War. After the War, I was state bridge engineer of Nebraska for several years, then went to Kansas City and worked for a bridge construction company, and now for several years have been a bridge engineer with the United States Public Roads Administration. I was interested to know that you are in the webbing business. . . . I sometimes think that you fellows who branched out into other lines were smarter than those of us who stayed with civil engineering. I feel sure that most of you are better off financially; at any rate, I would have no regrets if I were in your place. . . ."

Ed Hurst, II, has removed from Fall River to 17 Wauwinet Road, West Newton, Mass. — T. H. Mace, Jr., IV, is with Fetherstonehaugh and Durnford, 660 St. Catherine Street, Montreal, Quebec. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

## 1914

Two classmates associated with the Bell Telephone Laboratories came in for laurels in the National Association of Manufacturers' Modern Pioneer awards, celebrating the 150th anniversary of the United States patent system: Herman Affel received an award for basic telephone inventions, particularly concerning automatic gain control at repeater stations. E. C. Wentz's award was for the invention of the condenser microphone and loud-speaker equipment of comparable quality. — Speaking of patents, Phil Currier, who has been engaged in commercial engineering with the General Electric Company ever since graduation, has found time, despite his travels to South America and elsewhere, for development work that has resulted in the granting of ten patents. His last one was for a limited speed series thyatron motor.

In a letter to Charlie Fiske, Jerry Jerome mentioned the fact that he has a son who is a junior at Technology. This is one whom your Secretary missed and brings to eight the total of '14 sons who

are now juniors at Technology. Jerry also has two other children, both girls. He has been associated with the New York Central Railroad, mostly in engineering activities but partly in the operating department, since graduation. Like the postman, he states that one of his hobbies is railroading, the other being golf.

C. W. Ricker has been elected second vice-president of the Louisiana Engineering Society. Lucian Burnham reports that in celebrating his recent promotion to a lieutenant colonelcy he went to New Orleans and tried to find Ricker, but unfortunately did not succeed. Burnham expects that his promotion will not release him from the Marine Barracks at Quantico, Va., where he is post maintenance officer.

When your Secretary saw Thorn Dickinson at Los Angeles last June, Thorn said that he expected to be there for just a short while. Now he reports that the traffic survey on which he is working is humming along at full speed, and although a year has passed he expects to stay on for a while longer. — Almost every edition of a Los Angeles paper contains some news item regarding Donald Douglas. It might be added that these references are not limited to Los Angeles papers. With the increased interest in aviation, particularly military aeronautics, Don or his company is almost continually in the press. An example of the coverage that Don gets is a clipping the Secretary has from the Sayre, Okla., *Sun*, telling how Don started business in the back of a barbershop and now has the biggest industrial unit in Santa Monica.

Ross Barratt of New York was laid up with the gripe during the latter part of the winter but is out again, scurrying for architectural contracts. Another New Yorker heard from recently was Tom Duffield, who is registrar of records for the department of health of the city of New York. Between Tom and Homer Calver, who is looking after the health exhibit at the World's Fair, classmates visiting New York should have no difficulty in getting their health cared for.

Carl Anderson reports from Portland, Ore., that he is engaged in consulting mining engineering work. His son, John R., will be graduated in chemical engineering from Oregon State this month, and he is hopeful of entering M.I.T. next fall for graduate work. Anderson also has one daughter.

Will you be at Cambridge on Alumni Day, this Monday, June 3? — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

## 1915

The big day is here at last! Everything and everybody is all ready for our twenty-fifth reunion. We are looking forward to a grand time renewing old friendships. Everybody has worked most willingly and readily, and the success of the reunion is due to the splendid co-operation of the committees. In New York on April 8, I had lunch with the committee; under

## 1915 Continued

Hank Marion's guidance as chairman they have done a splendid job. The Philadelphia gang had already enjoyed one luncheon and had planned another for May 15, to round up a big bunch of Pennsylvanian classmates. From all over the country have come enthusiastic reports from our key men and from men who have written to them. My personal thanks to everyone who has helped so generously in this work.

Bill McEwen from Wellsville, N.Y., deserves the prize for the first definite enrollment: On April 17 he sent his check as an assurance that he would be present. Quite aside from reunion plans we had an interesting letter from Vik Enebuske mailed on April 1 from the Grand Hotel, Lund, Sweden. Excerpts follow: "The outbreak of the war in Europe, while it may have benefitted many people, left me high and dry and undecided just what to do. I saw an opportunity to visit Sweden, where I had not been since I was five years old, although I am American born. . . . I finally sailed March 18 on the *Bergensfjord*, Norwegian-American Line, from New York headed for Bergen, Norway, to visit my father in Sweden. The ocean trip, taking nine days, was uneventful and rather quiet. The passengers consisted mostly of Norwegians, Swedes, Finns, and Danes returning to their native land. . . . The head of the Finnish relief, Odd Nansen, son of the Norwegian explorer and humanitarian, Fridtjof Nansen, who worked with the same company I did twelve years ago, was returning to Norway. . . .

"To comply with requirements of the State Department, I had to disembark at Bergen and travel overland. . . . I took the morning train for Oslo, the capital of Norway, traveling a distance of 306 miles over some of the most beautiful scenery in Europe. I went to school two years in Switzerland long before I went to Tech, so I know what I am talking about. The impression I got of the country was that the valleys between the mountains were rather narrow, leaving access for picturesque fiords, rivers, and lakes. I think that less than 10 per cent of Norway is under cultivation. The railroad climbs at one section above the tree limit into snow all year round to a maximum elevation of 1,300 meters above sea level, making a wonderful ski country within easy access of Oslo, especially at Finse, Haugastøl, and many other places. . . . In the afternoon it snowed, and I got to Oslo in the evening in a snowstorm, three days after Easter.

"On account of the coal restrictions, warm baths can be taken only between 7 and 10 A.M. and 7 and 9 P.M. That was the label in my room when I arrived, and since I arrived after 9 P.M. I took my bath at eight o'clock the next morning. It was a piping-hot tub bath, the first fresh-water bath I had had since I left New York. . . . Before leaving Boston, I had made the acquaintance of a young Norwegian from Oslo, who is studying in Boston to enter Tech next year. He had asked me to look up his father, which I promptly did in the morning. Besides

having his own business, his father was also a consul-general. . . . I was invited to dinner at his house in the afternoon, and he insisted on my having a guide from his office during the day, to take in the sights about Oslo. . . . That night I took the sleeper to the southern part of Sweden, to Malmo, opposite Copenhagen, Denmark, and then proceeded to lunch at a hotel a short distance away, where I found my father, whom I had not seen for four years.

"Lund is a university town. There are two universities in Sweden: Uppsala and Lund. Uppsala was founded in 1477, and Lund, in 1668. My father was once a professor at the University of Lund and is today an honorary member of the academic union. . . . There are the same good relations among Norway, Sweden, Denmark, and Finland that exist between the United States and Canada. I don't believe that any of the belligerents have the intelligence to tell Scandinavia what to do, regardless of might and power. You know here at Lund in the year 1676 there was a battle between the Swedes and the Danes, where half of the combatants fell on each side. Those days are passed, and Sweden and Denmark have seen the folly and have outgrown wars, which ought to be a lesson to many European powers of today."

I received this letter in Boston on April 17, a month from the day Vik sailed, which is remarkably quick dispatch and a tribute to Vik's loyalty in writing us so soon after he sailed. I should like to know his feelings now, as the Norwegian campaign began after his arrival. — Everybody has "*helped Azel*" to bring 1915 back to Tech for our twenty-fifth reunion. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline, Mass.

## 1916

Jap Carr has started a new baking plant in Greenwood, S.C. He expects to stay there for six or eight months, and his family will join him at one of the resort places in the North Carolinian mountains for the summer. A year ago the Carrs adopted a year-old boy. — George and Mrs. Petit have adopted an infant son whom they have named George H. Petit, III. George recently purchased a house at 18 Greenhurst Road, West Hartford, Conn.

Duke Wellington attended a public health officers' convention and dinner in Hartford, Conn., during the week of April 15. As a matter of fact, his picture appeared in the Hartford newspaper. Duke looks just the same as he did at our last reunion and as he probably will look when we all see him again next year.

Steve Berke writes: "About a month ago I flew back from Chicago to Boston, and while I was stopping over at the airport in New York, Mark Aronson boarded the plane for the trip to Boston. I did not have much opportunity to converse with him, but he was looking pretty well and from appearances I should say he had his march to success pretty well in hand. I see Harold Whitney on

and off around lunchtime in Thompson's Spa. As our twenty-fifth reunion approaches, Harold speaks quite keenly about getting organized. . . . Ralph Fletcher, our rough-and-tumble classmate, was in the office some time ago. He certainly is getting as rugged as the granite which he cuts out of them thar hills in northern Massachusetts. Remembering his playful habits at the 1936 reunion and eyeing his present-day robustness, your Associate Secretary immediately joined a physical-culture class in order to be in shape for some of Ralph's playful caresses.

"Al Kleiner is still the ace designer in the bridge department of the Massachusetts Department of Public Works. He was abroad not many months ago, and his daughter was married recently in England to a British naval officer. Al has done some very commendable work in bridge design. Your Associate Secretary continues to struggle for success at the building of roads, bridges, dams, and so forth. At the present time, construction seems to have slowed up a great deal, and many of the contracting organizations are badly in need of a few jobs. We are very fortunate, however, for last fall we were successful in securing the contract for the largest flood-control dam in New England, the Franklin Falls Dam on the Pemigewasset River in New Hampshire, a job which totals about four and a quarter millions and which will take a couple of years to build. If any of the boys are around Franklin this summer and are interested in seeing this work, I shall be glad to take them over it."

Joe Barker, our illustrious dean of the school of engineering at Columbia University, has been elected vice-president of the American Institute of Electrical Engineers for 1940-1941. He is also a member of the committee on engineering schools of the Engineers' Council for Professional Development. — The following classmates and wives attended the Technology Club of New York dinner on March 5, at which Dr. Compton was the guest of honor and Vannevar Bush, one of the speakers: Mr. and Mrs. Frank Hubbard, Mr. and Mrs. William Farthing, Francis Stern, Mr. and Mrs. Leonard Best, Joe Barker, A. P. Caldwell, Jr., Dr. and Mrs. Robert Wilson, Commissioner and Mrs. Walter Binger, and Mr. and Mrs. James Evans. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

## 1917

On the way to Washington, I ran into Paul Woodward. Unfortunately his blond head did not come clearly into sight until near the end of the trip, but by cross questioning I found that he is now general manager of the American Viscose Corporation plant at Parkersburg, W.Va., and that personnel and policy problems are contributing to his worries fully as much as more technical matters once did. He has three daughters, has recently built a new home, and generally is keep-



1917 Continued

ing extremely busy, as always. I also met Lin Noyes and Phil Hulburd holding a private reunion in the lobby of the Roosevelt Hotel in New York. Both looked well, happy, and prosperous.

An item in the Norfolk *Virginian-Pilot and Landmark* quotes an article in the "Virginia Public Welfare," a bulletin published by the state department of welfare, of which Henry G. Parker is director. He is quoted as saying that the Works Progress Administration program "has gotten too darned efficient. . . . Let us again find the old yardstick and measure its success by the degree to which it succeeds in putting to work the largest possible number of the most needy unemployed as usefully as possible. If this can't be done, then let's be honest and proclaim WPA a work program and not a work relief program."

An item from the Worcester evening *Gazette* sent in by O. B. Denison '11 notes that Frank C. Howard, was elected secretary-treasurer of the Worcester Chemists' Club on April 23. Frank is also very active in affairs of the Worcester County Alumni Association of M.I.T. and is at present a member of the executive committee.

And finally, Skipper Works was elected secretary of the Technology Club of Chicago and became a father once again on the same day! — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

## 1918

The only member of this Class who seems to have made the news during the month of April is our President, Frederick Alexander Magoun. Maggie made a speech before the Republican Women's Club of Massachusetts in Boston on April 6. His topic was "The Art of Human Relations." This was one of eighteen outside speeches made by him that month, including one before the Class of 1909 in New York on April 13.

On April 12, members of the Class from New York and vicinity met for dinner. The luncheons have been held in the Williams-Technology Club Building, and your Secretary could not attend, much as she wanted to. This time, thanks to Pete Sanger, the dinner was held at a time when and place where your Secretary could be present. At this meeting — which was held just for the pleasure of each other's company — were present Granny Smith, Ev Rowe, Sax Fletcher, Ned Longley, Clarence Fuller, Tom Brosnahan, Mike Malley (who hadn't attended a class dinner for a long, long time), Al Smith, Sidney Grossman, Pete Sanger, and yours truly. Clarence Fuller and Ev Rowe had been serving on the jury at White Plains, N.Y., and were rather excited about their numerous cases.

Ev and his wife had the unique experience of being the first husband and wife to be drawn on the same panel since women have been allowed to serve on juries.

You have now all received the pledge cards for our gift for the twenty-fifth reunion in 1943. I sincerely hope that this money will be forthcoming very soon, and that we will be assured the organ before next graduation. — May the Class also know that the New Ocean House in Swampscott, Mass., is to be the scene of our twenty-fifth reunion. Arrangements are going ahead for this celebration. Will classmates please send me news? Someday soon, when I have no news at all, you are going to find a blank. — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

John P. Putnam is a research engineer with the Reece Buttonhole Machine Company of Boston. At present he is spending much time on the development of a wide-range tuning device for all-wave radios, employing powdered iron variometers and solid dielectric variable condensers. He tells us his hobby is flying — and a thrilling sport it must be. — Robert A. Montgomery writes that he is with the Carborundum Company in Niagara Falls as department superintendent; golfs in summer, bowls in winter, and raises tulips. — Stuart J. Hayes says he is pursuing the uneventful life of a commuter. His letter states in part: "The twins are rapidly becoming young ladies, and their youngest sister starts school this fall. Seldom see any of the boys. By the way, what happened to the Boston section of the Class that started so bravely with two meetings a couple of years ago and then died a-borning?"

The following letter came from Joe Newell: "What sort of news can a fossilized professor present that is of interest to his more practical classmates — particularly when he and a group of his associates about fifteen years ago dedicated their lives to making airplanes safe — for other people to fly in — and he now finds himself up in the air occasionally trying to save a little time? Between teaching a few fledgling aero engineers how to keep wings on their terrestrial transports — I'm told the wings don't come off the celestial kind — and trying to get jobs for them after they're 'educated,' I don't have much time for exciting problems. One comes up occasionally, of course, but it's either hush hush or too technical to be of general interest. I have recently been playing with a 200-foot-diameter windmill design which may turn out to be interesting if it prove to be economically justifiable. No, it's not to keep the bathers cool at Coney Island nor to absorb energy from the turbulent air in the Senate chamber in Washington, but to keep toasters, washing machines, doorbells, and other prosaic electrical contraptions functioning as, when, and if."

Alfred L. Warren has moved from Texarkana, Texas, and his new address is now Southwestern Gas and Electric Company, Shreveport, La. — Francis D. Porcher has moved from 430 to 620 West 116th Street, New York, N.Y. — John O. Merrill resigned last October from the Federal Housing Administration, with

which he had been connected since 1934 as an architect in the Chicago area, and is now engaged in private architectural practice with the firm of Skidmore, Owings and Merrill, who have offices at 104 South Michigan Avenue, Chicago, and 5 East 57th Street, New York City.

The following note was received from Amos N. Prescott: "Living in Passaic. My daughter, Nina (seventeen years old), is entered for a Vassar education; son Amos, Jr. (fifteen), is in his second year at Andover; and son Teddy (nine) is still in Passaic Collegiate School. Visited Gilbert F. Beers in Atlanta, Ga., a couple of years ago. He has three lively and lovely daughters." — J. W. Reis, Jr., states that he hasn't seen any classmates for at least fifteen years, but it is evident that he follows the class notes in *The Review*, for he writes: "As for myself, I presume that I am one of the few bachelors left in our Class, judging from what I have read in your much enjoyed notes in *The Review*. Most of the boys seem to be happily married and settled down with nice large families. Maybe that is why so many of them are able to write 'president,' 'general manager,' 'chief engineer,' and so on, after their names; the Class seems to be doing very well for itself."

Margaret Pierson Olfene tells us: "One of the coeds, to be sure! Engaged in human engineering. Job: Girl Scout professional at Lynn, Mass. Daughter is as tall as I, and thirteen. We bicycle, hike, and garden." — A letter to Robert E. Friedlich brought the following response: "Please excuse delay in answering. As I was originally Class of '19 but did not graduate until 1921 on account of the War, I always split the difference and call my Class 1920." — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York, N.Y. GEORGE W. MCCREERY, *Assistant Secretary*, 275 Cypress Street, Newton Centre, Mass.

## 1920

First and foremost, let me remind you to check and return the stub on Pete Lavedan's announcement regarding reunion if you haven't already done so. You have about four days to get in touch with P. F. Lavedan, Liquid Carbonic Corporation, 52 Vanderbilt Avenue, New York, N.Y.

It is a pleasure to report the following indications that 1920 has to be reckoned with when it comes to deciding which is the most illustrious Class at the Institute: Bob Patterson has been elected assistant treasurer of the John Hancock Mutual Life Insurance Company. Bob has been with the John Hancock since 1934, and his promotion to this highly responsible position is well merited. Then, you read in the April Review that Ray Ridgway, director of abrasive research for the Norton Company at Niagara Falls, N.Y., was chosen by the National Association of Manufacturers to receive one of the awards for outstanding invention and research. Ray's award was for his research in boron carbide, known as Norbide and considered the hardest abrasive ever produced for commercial purposes.

Another count in our credit: Marcial E. Martinez has been appointed assistant general manager of the Lautaro Nitrate Company, Ltd., and the Anglo-Chilean Nitrate Company. These two enterprises produce Chilean nitrate of soda at the rate of about one hundred thousand tons a year. This tonnage has a market value of around thirty-five million dollars. Add also this feather: According to a recent editorial in the New York *Herald Tribune*, the eightieth annual report of Cooper Union, the first under the direction of Edward S. Burdell, is evidence of the success of Dr. Burdell's administration. Says the *Herald Tribune*: "Cooper Union seems certain to grow physically as well as in public esteem."

Henry B. Prescott, II, may be located at 57 Oak Street, Newport, N.H. Henry L. Nash, III, is now at 11 Kensington Road, Edgewood, R.I. Norman C. Scudder, VI, is at 960 Gladstone Street, Detroit, Mich. Creighton B. Stanwood, X, is living at 12 Kilburn Road, Belmont, Mass. Edmund C. Sullivan, I, is with the United States Public Health Service at the United States Marine Hospital, New Orleans, La. Livingston Wright, III, has been made a professor at the University of Alaska. George I. Brown, II, is with Brunker, Jones and Page, Inc., 1726 Conway Building, Chicago, Ill. Archibald H. Kinghorn, Jr., VI, now lives at 1169 Cleveland Drive, Covington, Ky. Donald B. Sanger, VI, is a lieutenant colonel of the Coast Artillery, at present in Washington, D.C. Captain Harland A. Gray, XV, may be reached at 135 Harding Road, Red Bank, N.J. Alfred Hand is apparently a gentleman farmer on his estate, Brook Hill Farm, Hamilton, Va. Carlos A. Stowhas is with one of the nitrate companies in Chile. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## 1921

Last call for Cambridge! Get your hat and run — don't walk — to the nearest transportation to Alumni Day, June 3! — Frederick W. Binns, X, is with the Virginia Smelting Company, for whom he has been doing chemical development and field work for the past nineteen years. His office is at 131 State Street, Boston. He has written to Ray St. Laurent in part: "I have lived in Wollaston until last fall and have now moved to 192 Manning Street, Needham Heights, Mass., which is just off the Worcester Turnpike. While in Chicago recently I ran into Dick Poole, II, who is with Frosted Foods at their New York office, 250 Park Avenue. You doubtless know that his father is president of the American Society of Refrigerating Engineers and one of the leading lights in the refrigeration industry. On a trip to Georgia, I met Bob Black '22, who lives in Wellesley but spends most of his time in the South traveling for an insurance group."

John W. Rockefeller, Jr., IX-B, printing consultant at 72 Washington Street, New York City, broke into print with an article, entitled "Management Looks at the Worker," appearing in the February

issue of *Editor and Printer*. [*Editor and Publisher?*] This article is part of the address which John gave to the Hartford Employing Printers Association and which was enthusiastically received as a timely analysis of the personnel factor in the printing industry. John has been actively engaged since 1928 in handling varied assignments in the management and operation of printing plants. He lives at 16 Park Circle, Short Hills, N.J.

William C. Ready, I, failed us in a recent appeal for news, but he is to be excused this time in view of the following announcement from the Boston *Herald* of March 26: "Miss Helen Geraldyn Conley, daughter of Mr. and Mrs. Matthew M. Conley of Lowell, and Mr. William C. Ready, son of Mrs. William B. Ready of Lowell, were married yesterday at a nuptial mass celebrated at St. Michael's Church. Mrs. Ready has been prominent in affairs of the Lowell League of Catholic Women and of the Seton Guild and for a number of years has been the head of the credit department of the A. G. Pollard Company. Mr. Ready was graduated from M.I.T. and is civil engineer and superintendent of construction, Quartermaster Corps, U. S. Army, Army Supply Base, Boston, and is a past president of the Technology Club of the Merrimack Valley. Mr. and Mrs. Ready will make their home at 12 Frost St., Arlington, Mass." Heartiest congratulations.

Hilliard D. Cook, X, general superintendent of Sweet Brothers Paper Mills, Phoenix, N.Y., is the author of a very comprehensive study of "Technical Control in the Tissue Industry" which appeared in the *Paper Mill and Wood Pulp News*. The study represents an investigation into the control technique of sixteen paper mills producing tissue and was presented at the Superintendents Association convention in Washington. Hill has managed the affairs of the Sweet plant since 1936 and lives at 28 Main Street, Phoenix.

New addresses of the month include: Palmer W. Griffith, V, 907 DeWitt Street, Linden, N.J.; Ernest F. Henderson, Jr., XV, Walden Pond Road, Lincoln, Mass.; Captain Leland H. Hewitt, I, United States Engineer Office, Post Office Building, Galveston, Texas; Fred R. Kingman, 2345 Kalakaua Avenue, Honolulu, T. H.; Clifton B. Morse, XV, 1222 Hill Drive, Eagle Rock, Calif.; Gunnar Opsahl, I, Hønefoss, Norway; Carl Thumim, II, 909 Tunbridge Road, Lansdowne, Pa. — We'll be seeing you next week. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, International Telephone Development Company, Inc., 137 Varick Street, New York, N.Y.

## 1922

Your Secretary has thoroughly enjoyed reading the class notes for the past two months. They were not only more newsy and fluent than usual but your lazy Secretary did not have to write them. Many thanks to Yard Chittick for taking over the details willingly. The Class looks forward to more of Chittick's reporting.

Apologies are due to Bill Mueser of Moran, Proctor, Freeman, and Mueser, New York City, to Whitworth Ferguson of Ferguson Electric Construction Company, Buffalo, N.Y., and to Alexander D. Ross, Canadian Comstock Company, Montreal, for the omission of their names from the April notes listing the Honorary Secretaries.

In the February issue of the *Proceedings* of the American Society of Civil Engineers, appeared an article entitled "Measuring the Potential Traffic of a Proposed Vehicular Crossing," written by Nathan Cherniack, XV. Cherniack was editor of the 1939 *Proceedings* of the Institute of Traffic Engineers and is now president of the Society of Terminal Engineers. He is with the Port of New York Authority in New York City. — The Boston *Herald* for April 7 carried the news of the engagement of Miss Dorothy Viets of Cambridge to Norman Prescott Randlett, IV, of Laconia, N.H.

On an extended and very busy trip to the West Coast, your Secretary was able to visit and report on three members of our far-flung Class. In Los Angeles, F. Marion Banks, XIV, is vice-president of the Southern California Gas Company, reputedly the world's largest distributor of gas. Banks has won a high place for himself in the esteem of the gas industry, not only throughout the country but also — which is perhaps more significant — in his own home town and state. The Bankses live at 2727 Morsley Road, Altadena, Calif., in the shadow of Mount Wilson. Visitors to Los Angeles are advised to expose themselves to an invitation from the Bankses for an afternoon and evening on top of the mountain. The Bankses have one son, David, fourteen years old, who is keenly interested in engineering as a profession.

In Los Angeles, also, I saw Windy Hammond, XV, who looks after the interests of Worthington Pump and Machinery Corporation in southern California. The Hammonds have built an attractive home at 10478 Wilkins Avenue, Westwood, which lies on the outskirts of Los Angeles, adjoining Santa Monica and the seashore. The Hammonds have three children: one boy who is already taller than Wes; a second son, Dick, ten years old; and a baby girl.

John Nichols, VIII, moved to San Francisco from Pittsburgh about five years ago. He is still with the American Sheet and Tin Plate Company and looks after all of their affairs on the West Coast. John hasn't changed since we last saw him at the ten-year reunion. He has even preserved his state of bachelorhood, and he says there is no likelihood of his changing his mind. He lives with his mother in San Francisco. American Sheet and Tin Plate does not have a plant on the Pacific Coast, and John makes his headquarters with the Columbia Steel Company, division of the United States Steel Corporation, in the Russ Building, San Francisco.

These notes will reach you just in time for you to make plans to attend Alumni Day, June 3, in Cambridge and the in-



1922 Continued

formal class get-together on Sunday, June 2. Headquarters for the visiting firemen will be at the Hotel Kenmore — at the junction of Commonwealth Avenue and Beacon Street — where a general meeting room has been established. Golf has been arranged for Sunday afternoon at the Belmont Country Club, Winter Street, Belmont, and golfers should report to class headquarters in the Kenmore not later than 11 A.M. on Sunday. An informal stag dinner will be held at the Kenmore at six-thirty Sunday evening. Reservations for golf are necessary in advance and are desirable for the dinner. Just call or write C. Yardley Chittick, 77 Franklin Street, Boston. Drop in and meet the gang whether or not you are attending the Alumni Day festivity. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. C. YARDLEY CHITTIK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

## 1923

The first news this month is to report on the proposed 1923 Garden. Bob Shaw wrote to every member of the Class (except a few in foreign countries) giving full particulars. Briefly, the garden is to be one of the most conspicuous features of the swimming pool building to be dedicated next week, June 3, on the site of the old athletic field. Its importance will be apparent when you see the building, as many members of the Class will on Alumni Day. Following the poll of class sentiment, which indicated that the project was a popular one, the class executive committee voted to authorize Bob to present the garden to the Institute. He therefore did so, and by the time these notes appear I think it is safe to say that the gift will have been accepted. We have assurances from the Institute that the garden, once constructed, will be maintained.

On graduation, 441 members of the Class took out endowment insurance policies in favor of Technology. Of these, 302 have been paid by reason of death or have lapsed. The cash value of the lapsed policies has been realized also, so that there are funds in the hands of the Treasurer of the Institute in favor of the Class. These funds exceed the \$10,000 authorized for the garden project, and it is these cash funds that will be used for it. No part of possible proceeds from policies still in force will be used and on the basis of funds due at the end of the twenty-five year period, there will be somewhat more than another \$10,000 which the Class can present to the Institute on the twenty-fifth reunion as planned.

The response to Bob Shaw's letter showed 217 of the Class in favor of the project and 36 against it. The vote represented only a small part of the 800-odd former students on the '23 list. Approximately half of our list consists of persons who do not consider themselves active Alumni, and the response from the remainder was one of the best the officers have had to any class mailing. So the vote may be taken as representative. Numerous

persons responding to the question about the desirability of the project expressed the thought that those who had been interested enough to keep up payments on their policies should have the deciding voice in the matter. The vote of the 139 whose policies were in force showed 85 for, 31 whose approval was qualified or who voted negatively, and 23 who did not vote. Bob wrote to those in this group who had voted negatively asking their reconsideration. The response showed only a few who were at all strongly opposed. A number of those opposed took their stand under an impression that the fund was originally planned for some special project, such as dormitories or endowment. As a matter of fact, the funds have never been earmarked. This explanation seemed to appease some of the small number of dissenters.

Jack Keck was laid up for a period of five or six weeks as a result of a fall on slippery pavements in March. I had a note from him from Bellevue Hospital, New York, where he was convalescing from a skull fracture. He had been in the Bronx, living there temporarily, because of some research which he was doing — I believe in connection with color photography. He was taken to an emergency hospital in Fordham, then to Bellevue where they could make necessary tests. He mentions that among callers were Bill Coleman and Lem Tremaine. A note from Miles Pennybacker, who was taking a short vacation in West Virginia and Indiana, said he expected to be back about April 24 and was planning to take Jack home from the hospital then. — Herbert C. Ludeke, formerly connected with the Boston office of the Curtis Publishing Company, has moved to the Philadelphia office of that company.

Charles H. Robinson, whose death on February 22 was briefly reported last month, had been head of the science department of the North Shore Country Day School at Winnetka, Ill., for the past five years. He had been ill about a year. Before coming to Winnetka, he had been at the Eaglebrook School, Deerfield, Mass.; the James Franklin School, Toledo, Ohio; the Arnold School for Boys, Pittsburgh, Pa.; and the Hoosac School, Hoosick, N.Y. He is survived by his widow, the former Arlene Woodman, and two children — Charles, fourteen, and Sally, twelve.

A pleasant dinner and evening was enjoyed by the Boston contingent, whose representatives — twenty-one in number — got together on the evening of April 16 at Walker Memorial. There were ten couples. Harold B. Golding, the lone bachelor of the crowd, was seated between two ladies at the dinner table and refused to let them embarrass him. Those there with their respective ladies were Frank Haven, Pete Pennypacker, Howard Russell, Ed Averell, Herb Hayden, Bert McKittrick, Don Height, Walt Marder, Penn Howland, and Horatio Bond. After dinner, which was arranged by Howard Russell, the party adjourned to the Walker bowling alleys, where Walt Marder directed the bowling. Everybody

had such a good time that it was voted to do it again sometime. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JAMES M. KECK, *Assistant Secretary*, 441 Mount Prospect Avenue, Newark, N.J.

## 1925

From the Boston *Globe* of March 25 we learned that our legal switch hitter, Al Malagodi, is to marry Miss Blanche M. Lavoie, daughter of Mr. and Mrs. Joseph Lavoie of Salem, Mass. Al, having followed a legal career, beginning with Boston University Law School, has been for three years assistant United States attorney in Boston.

Professor Locke'96 writes that Glen Bateman, who has been a sales engineer and director of his father's firm, Edward L. Bateman, Ltd., has joined the South African Air Force for the duration of the war. We all join in wishing him a safe termination of his period of service. — HOLLIS F. WARE, *General Secretary*, 3 Aquavia Road, Medford, Mass. F. LEROY FOSTER, *Assistant Secretary*, Room 6-202, M.I.T., Cambridge, Mass.

## 1926

Giles E. Hopkins, who spent eleven years as technical director of the Bigelow-Sanford Carpet Company and a subsequent period with the United Shoe Machinery Corporation, has been appointed technical director of the United States Asbestos division of Raybestos-Manhattan, Inc. He is in their Manheim, Pa., laboratories. — Ben Richardson, Mrs. Richardson, and their daughter called at the Institute on March 22. The Richardsons have taken up ceramics as a hobby, and one of their objectives was to see some of the exhibits and to talk with some of the experts in the field of ceramics. — March also brought Dick Jones back to the Institute. He was on an ivory hunt for his firm, the Atlantic Refining Company. Earlier Ted Mangelsdorf had paid us a visit, although the Secretary regretfully did not make contact with him.

A pleasant letter from Elmer C. Warren, who is registrar of Colby College, reported that one of the recent visitors to Colby in search of young men for the Aetna Casualty and Surety Company proved to be our classmate, Conly. — Helmut W. Geyer wrote to the Secretary recently inquiring about the Edgerton high-speed films. He is utilization engineer with the Southern Counties Gas Company of California with headquarters in Los Angeles. — Robert A. Williamson has recently been changed from the transportation department of the General Electric Company to the marine engineering department. — A recent publication has come to the Secretary's desk, "Structural Analysis Laboratory Research, 1938-39" by John B. Wilbur. This has proved to be an impressive report on the work which Budd has developed at the Institute. — Willard Edwards of Buena Park, Calif., is still in radio broadcasting work but as an avocation he has been doing civilian flying. Bill made his first parachute jump recently, not as a necessity but as a part

of the training program. — John B. Jacob is now living at 36 After Glow Way, Montclair, N.J. — Douglas P. Jeppe currently lives in Oklahoma City. — Allen Orth continues with the General Motors Research Laboratories in Detroit.

Henry Rickard, whose address is United Shoe Machinery Corporation, Boston, apparently is actually working in South America. A recent letter from him is of biographical interest: "... I was in France for two years, stationed in Paris but circulating all over that lovely country. I always did like France, and I enjoyed the two years very much. Then I spent the next two years in Boston, still with the foreign department of the United Shoe Machinery Corporation, and now I am in South America for it. I am regularly in Buenos Aires, although I recently spent two months in Chile, where I shall be again for about six months later this year. Early next year I am scheduled to go home for my vacation in the States; that is as much of my wanderings, past, present, and future, as I can account for now.

"You Texans probably don't know the first thing about the United Shoe. Well, we build and lease machinery for making shoes. Each machine has a meter, and the customers pay us in accordance with their production. We also have a line of sale machines to supplement the leased ones which are used for all of the principal operations. Then, we sell about everything, except leather, that is used to make a shoe — wire, tacks, cements, shank pieces, eyelets, box toes, and so on. Down here in the Argentine we have started a factory for making these different items and, in getting the factory started, I was, much to my surprise, right back into engineering.

"... Although in Chile I did a bit of fishing, I'd rather play golf than fish. ... Here in the Argentine I ride a bit when I feel guilty about making my wife a golf widow. ... South America is on the Continental schedule of business hours. About everyone eats the noon meal at home because offices shut at noon for two hours, too long to spend eating anything except Thanksgiving turkey. The natives get in their siestas, of course, but I never take one, and if I did, I wouldn't admit it. Imagine a grown man sleeping in the day time! ...

"I saw Bill Sessions a couple of times before I left America this last time — also Ted Butler, Mabley, and a few others around Boston. In Paris, I used to see Dave Shepard a bit. He said that Jim Clifford is teaching English in some western university. What news do you have from Al Orth, Speed Hopkins, Bob Huthsteiner? Never a word have I ever heard from any of them, and I'd very much like to." — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

## 1927

Wedding bells were heard at Birmingham, Pa., on January 6, when Thomas C. Grier, famed President of the Grier School, Inc., and Miss Solveig Berg, a member of the staff (and, incidentally, a

very charming young lady) pronounced the solemn vows in the school chapel. Al French stood beside the bridegroom, and Dike Arnold led the procession down the aisle.

Through Joe Burley's work, the Boston Insulated Wire and Cable Company's ignition wire has not only been approved but is now specified for all commercial airplanes. Joe hopes to sign up the Army and Navy. Incidentally, it is reported that Joe has taken an interest in amateur theatricals and was recently seen behind the footlights in Milton. — Bob Bigelow of the United Shoe Machinery Corporation has purchased a home in Wellesley Hills. — Lew Baker has been seen in various parts of the country recently, doing special management counsel work. — Ezra Stevens was transferred to Washington last fall to open a new office for the Raytheon Manufacturing Company. — Having noted Jimmy Chirg's advertising in *Fortune*, we gather that his agency has become truly national in scope. Orchids to Jimmy!

Dave Knox has been with Bundy Tubing Company of Detroit since 1932, and he has been involved in time study, job analysis, research, and process control; last October he became chief engineer of the company. Married in 1934, the Knoxes have two youngsters: Dave, Jr., who is a little over four years old, and Janet, born last July. Dave sees Joe Yates quite often at the Detroit Technology Club meetings. Joe is general manager of Joseph S. Yates, producers of men's garments. Dave and Tom Knowles have each written concerning Gordon McNeil and Hal Hibbard, who are with Goodyear. McNeil is field contact man in the mechanical goods division and apparently is out much of the time making engineering contacts for the company. He married an Akron girl about a year ago. Hal is in charge of one of the production units, is married, and has two children. Tommy Knowles, according to Dave, is "still lobbying for airships." Your Secretary has the real lowdown on this situation: Tom is vice-president of the American Zeppelin Transport, Inc., a company which hopes to operate large rigid airships on world trade routes. He continues also as representative of Goodyear Aircraft Corporation, known to us as builder of lighter-than-air ships. Tom is sold on the desirability of lighter-than-air transportation as a commercial proposition and is in Washington trying to get a chance for this type of transportation to prove itself. Since January, 1937, Tom and Mrs. Knowles have been living at the Mayflower Hotel in Washington.

Jim Chamberlain went to Goodyear upon graduation from Tech, but after a few years he left to join his dad in the United States Stoneware Company in Akron, Ohio, where they make chemical stoneware. Jimmy is doing well, is married, and has one daughter. — Bud Gillies, who is with Grumman Aircraft Engineering Corporation at Bethpage, Long Island, was reported as having dashed over to Europe by clipper a short time ago. — Another aviation enthusi-

ast is Franklin Kurt, who is a writer for the *Sportsman Pilot* and at the same time tests and sells planes. — Fred Willcutt is living in Washington and is connected with the Potomac Electric Power Company.

We have just received an unconfirmed report that Joe Hammond has transferred his connections to the Hollingsworth and Whitney Company, paper manufacturers, having become chief engineer of their new Mobile, Ala., power plant. For much of the news in these notes, your Secretary is indebted to Dike Arnold, Tom Knowles, and Dave Knox.

We hope that every man in our group will take part in the Alumni Fund. The number of participating members is just as important as the amounts given. Each member of the Class is hereby appointed a committee of one to do his part to put 1927 over in this new plan of yearly contribution. — RAYMOND F. HIBBERT, *General Secretary*, Care of Johns-Manville Corporation, 22 East 40th Street, New York, N.Y. DWIGHT C. ARNOLD, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

## 1930

Our sympathies are extended to Tul Houston, XVII, whose father passed away recently. Tul has been associated with his father in the industrial real estate business and will now become operating head of the firm. — Professor Locke '96 has passed along the information that Guillermo Zuloaga, XII, has been appointed assistant manager of exploration for the Standard Oil Company of Venezuela. — Paul Glynn, XV, who was with our Class for several years, is now affiliated with the Columbia Broadcasting System in New York City. The same city still claims Phil Torchio, II, who is mighty busy these days preparing for law exams. — Greg Smith, X, writes from Rochester, N.Y., that the illness of his four-year-old son David may result in his own absence from the reunion. Our best wishes to both David and his dad!

Ollie Green, XV, is one of the members of the alumni scholarship committee in Washington, D.C., and has been kept busy in his leisure hours interviewing prospective M.I.T. students from that area. He finds time between interviews to serve as president of two different bowling leagues and is also active in the affairs of the Washington Society of the M.I.T. and the Washington Delta Kappa Epsilon Association. — Bob Schildknecht, IV, of Cincinnati has been appointed architect for the state of Ohio and will be in charge of all design and construction undertaken directly by the state.

At this writing [April] thirty-five men say that they will be at the ten-year reunion without a doubt, while over one hundred others hope to attend or are interested enough in the affair to wish further information. The committee are very happy to find such interest reflected and feel certain that Old Saybrook will see more 1930 men on June 1 and 2 than turned out for our five-year reunion. When



1930 Continued

you read these notes, if the spirit hasn't already moved you to sign up, then come along to Old Saybrook anyway and you'll find us making merry at the Riversea Inn. — PARKER H. STARRATT, *General Secretary*, Bradley Park Drive, Hingham, Mass.

## 1933

We have a little news this month from a dinner New York classmates held in April. Fourteen of us enjoyed an old-fashioned bull session for a few hours at the Technology Club of New York. We learned that John Wiley has changed his business address from the air-express division of the American Express Company to the air-express division of the American Airlines, and is now located at LaGuardia Field. John tells us that the air-express business is becoming more and more popular all the time and that in the not-too-distant future, the airlines will be running planes for freight only. We were all interested in John's comments on the activities at LaGuardia Field, particularly those to do with the "charm school" for the training of hostesses. It must be an interesting place in which to work. — Dil Collins is still with Carleton Lamp in New Jersey, manufacturing small incandescent lamps. Dil also told us that they manufacture the sealed-beam headlights used by most of the new cars. — Al Bruce is with Dun and Bradstreet, Inc. We couldn't find out exactly what he does for them, except that we know he spends some of his time playing ping-pong while he is in the office on Saturday mornings. It sounds like strenuous work. — Carl Ekwall is with the Brake Lining Manufacturers Association, and travels around for this organization, taking care of a million and one details. The association handles all kinds of questions of interest to the member manufacturers. — Jack Andrews is still editing *Factory Management and Maintenance* with the McGraw-Hill Publishing Company and is putting too many evenings and Saturdays in at the office as far as yours truly sees it. Jack has been arranging for these occasional class dinners we have been having in New York for the past few years. — Leighton Rickards is with A. F. Hinrichsen, Inc., and keeps himself busy selling air-conditioning equipment. Leighton told us about one of their most recent products — "Koolshade" screens, which are supposed to keep out the direct sun rays and make the building cooler. — Larry Hubbard is with the Crosley Company, engaged in market research. Larry had some very interesting comments on the various popular advertising programs. — John Clark is with Phelps Dodge Copper Products Corporation and has recently come back to New York, having been to some of the other territories for Phelps Dodge. — Hugh McDonald is with the marine department of the Standard Oil Company of New Jersey and told us of some of the problems which have arisen from the war. Standard Oil has ships under all nationalities in all parts of the world and has had difficult situations to contend with.

— Bill Gray is still with National Union Radio, where he told us they give birth to new radio tubes practically every day. — Edward Lockman is with United States Rubber in the rubber-lined equipment division. Lockman told us of the many applications for rubber-lined equipment and a little bit about the way this equipment is produced. — Wen Allen is still with the Pennsylvania Railroad, working principally on the construction of the underground division from Brooklyn to Jamaica.

We have one marriage to announce this month, that of John Stuart Patterson to Miss Louise Bigelow Whipple on Saturday, the thirteenth of April. They plan to live at 1113 Hollywood Road, Linden, N.J. I am sure that we all wish them the best of luck. — It has been a long time since there has been any mail received at 330 Belmont Avenue from the Class. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-102, M.I.T., Cambridge, Mass.

## 1934

Among the top-ranking individuals in the '34 hall of fame is a lady from Canada, Elizabeth MacGill, who did graduate work in Course XIV with our Class and whose affiliation we are proud to have. An excerpt from one of the Montreal papers summarizes her achievements as follows: "Elizabeth (Elsie) Gregory MacGill . . . has added another triumph to the long string of distinguished 'firsts' which characterize her career. She was the first woman in Canada to receive a master's degree in aeronautical engineering, the first (and as far as we know) the only woman in Canada to hold a position in that profession, the first on this continent to become chief aeronautical engineer with any company, and now she has become the first woman to design, build and test her own airplane. . . ."

"After graduating from Trinity, Miss MacGill's first position was with an engineering firm in Detroit and, when that company went into aeronautics, Miss MacGill began studying along the special lines required for this highly technical and comparatively new field. Taking courses at the University of Michigan she won a scholarship for a course in aeronautical engineering but terms of the scholarship required that she live in Ann Arbor, the university seat, so she was obliged to decide whether she would continue her position or accept the scholarship. She chose the scholarship and went to Ann Arbor, there receiving the degree of Master of Science in aeronautical engineering, the first woman in the world to receive this degree. Here fate stepped in and dealt a blow which to a person of less high courage and determination would have put a tragic finale to a promising career. In the spring of the year she was stricken with infantile paralysis — and was an invalid for three years. When she recovered sufficiently

to get about with the help of a cane, the depression was in full swing, so she decided to attend the Massachusetts Institute of Technology . . . and continue her studies in aeronautics. . . . While there she received a scholarship and then the offer of a position which she decided to accept as a practising engineer by the Fairchild Aircraft Co., in Longueuil. From there she went to the Canadian Car and Foundry Company at Fort William as chief aeronautical engineer. . . ." — Gentlemen, let us doff our hats to the lady.

Bill Mahoney got quite a write-up in the Bridgeport, Conn., *Sunday Post* recently because of the uniqueness of the work he is doing. He is a safety engineer for the Yellow Mill Housing project, the largest single unit of government housing in New England. The primary purpose of his job is, of course, to prevent accidents. This work requires a combination of diplomacy in dealing with the contractor and the men, and mechanical ingenuity in diagnosing the job and prescribing a plan of procedure. The work on the Yellow Mill Housing project includes, among other things, the demolition of 230 houses. Bill has a lot of responsibility resting on his shoulders, but his employers have a good man for the job, and they evidently know it.

From faraway Greece has come news of Leonidas Keoylos, who is working for an English company, the Lake Copais Company, Ltd., at Aliartos. He does not say what the nature of his work is. Not long ago he married. Best of luck, Leonidas.

Donald Adler is thinking seriously about the future. He is engaged to Miss Florence Cushing, daughter of Mr. and Mrs. Dean S. Cushing of Wollaston, Mass. The wedding will take place early in the summer. — Dave Ingalls was married on March 14 to Mrs. Virginia Wells Lyons, daughter of Mr. and Mrs. Carl S. Wells of Marblehead, Mass. The ceremony took place in the chantry of St. Thomas Church, New York City, and was followed by a reception at Sherry's. The couple are living in Garfield, N.J. — On March 9, Fred Kaiser married Miss Ethel Noden, daughter of Mr. and Mrs. J. H. Noden of Malden, Mass. Teddy Hetzel was best man, and Justin Kearney was an usher. Fred is working with the General Electric Company in Pittsfield, Mass.

Some recent additions have been made to three of the families in our Class. None of them, however, will be a candidate for the Tech athletic teams unless the rules are changed drastically in the future. The new arrivals are Margaret Keever Redcay, born on March 19; Nancy Lois Ball, born on March 25, weight: 7 pounds 15 ounces; and Susan Morrow Callan, born on April 12, weight: 6 pounds 5 ounces. Congratulations, all you dads — I guess I deserve to be in on this applause, too. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, Chile Copper Company, Chuquicamata, Chile, South America.

## 1935

Cupid has struck again — Hal Everett and Jean McCollum of Brooklyn, N.Y., will wed. Hal is with the Foxboro Company, in the big city, as a sales engineer. — The University of Cincinnati provides us with two bits of news: Kuo Y. Cheng is studying for his doctorate in physics at the university; Max Nohl, our famous deep-sea diver and inventor, gave a lecture there.

Gerry DeGelder has left the Zurich Insurance Company and is now an engineer with the London Guarantee and Accident Company, Ltd., in their Chicago office. Earle Megathlin recently switched from the Farrel-Birmingham Company of Ansonia, Conn., to Westinghouse Electric and Manufacturing Company in Mansfield, Ohio. — The Class is well represented on the Alumni Day committees. Dick Lawrence is a member of the transportation committee and Jim Parker is serving on the exhibits committee.

Ham Dow has left the Bethlehem Shipbuilding Corporation, Ltd. He is now in the bureau of engineering, United States Navy Department, Washington, D.C. Ham likes Washington and has been busy looking for a house. Last October he became the father of a daughter, Jocelyn. — Bud Pflanz has been transferred back to Bartlesville, Okla., by Electric Advisors, Inc., where he is to make a reclassification of plant accounts for the Cities Service Oil Company. Don Gittens wrote Bud that marriage is wonderful. Bud also heard from Paul Germond, who states that business with the Revolver Company is the best in years. — Hope to see many of you fellows at the reunion. — ROBERT J. GRANBERG, *General Secretary*, Care of W. C. Voss, 9 Old Town Road, Wellesley Farms, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

## 1937

Do I seem to hear a far away murmur from far away — shall we say Puerto Rico? Yes, 'tis true — Lee Menzl, who came to us from Pratt Institute to study chemical engineering and is now in the sugar. He says: "I don't know whether you will remember me or not as I transferred to Tech in my senior year, but I thought that perhaps the boys of Course X would be interested in what has become of me since graduation. I started with the American Cyanamid Company, in their research lab at Stamford, Conn., as a junior chemical engineer. My work was mostly pilot-plant development and design. Finally, after two and a half years, I decided that I had had enough of development and wanted more practical engineering. On January 1 of this year, I started working for my father, who is consulting engineer for raw-sugar factories in Puerto Rico, Cuba, Santo Domingo, and South America. He immediately shipped me here to Puerto Rico to work in the factories of one of his clients and thereby gain some experience in sugar manufacture before I tackled any design problems. I am enjoying the experience

immensely and see great possibilities in the development of chemicals from the by-products of sugar. Well, who knows, I may be back in chemical development again. I have enjoyed reading about the fellows of '37 in the class notes and hope we will hear from a great many more. (Whozat talkin'? Johns? — Nope, Menzl.) Hope to see some of the gang when I return to New York this summer . . ." Thanks, Lee.

Thursday night, April 11, there was a meeting of the graduates who are now living in and about Plainfield, N.J. And would you believe it — there were about 150 of us there! Rupert Lewis and Les Johnson were present; Rupert was taking in the money. — John Nugent dropped me a line from 11 Bartlett Parkway, Winthrop, Mass., and when I say a line, I mean a line. He must have had writer's cramp: "Just a note to let you know I have recently located with Polaroid Corporation now situated in the shadow of the Institute. Also, Bill Burns, II-A, has started with us. I understand John Gould, V, is located in Brooklyn, N.Y., with an oil company, going there from Philadelphia. Keep up your good work on the column."

Miss Emily Tomlinson of Braintree and R. Cutler Low have announced their engagement, as have also Miss Marjorie Rosenberg of Lawrence, L.I., and Carl Sontheimer. By the time this comes out they may be married. I have no dates for the weddings. — In a candlelight service at the Old Cambridge Baptist Church at 4 P.M. on Saturday, March 30, Miss Lelia Wyman and Evan A. Edwards were married.

Al Finn of the team Finn and Fischer says that at the Arkansas Valley plant of American Smelting and Refining Company he has recently received a promotion to the position of assistant superintendent in the roasting department. Good work and keep going. The last note I have — F. R. Jackson, after taking further graduate work in the Harvard Engineering School, is now employed in the high-voltage laboratory in the Pittsfield works of General Electric.

I have here a letter from William N. Seaver, librarian at the Institute. He says that in his listings of books and other publications he has none from the Class of '37. Have we published anything? — WINTHROP A. JOHNS, *General Secretary*, 245 Hale Street, New Brunswick, N.J.

## 1938

Announced recently was the engagement of Ed Bossange, XV, to Miss Evelyn Arnold of Kentfield, Marin County, Calif., the wedding to take place late in August. When last reported, Ed was on Wake Island in the middle of the Pacific, working for Pan American Airways, so he must be doing some commuting in order to carry on in California. — Also engaged is Ernest Neumann, II, to Miss Sylvia Bevin of East Hampton, Conn. Ernest is now a member of the teaching staff at the Institute. — Frank Somers, VI, was recently engaged to Miss Jean Richards of West Hartford, Conn. They

are to be married this month in, of all places, Aruba, Netherlands West Indies, where Frank is with the Lago Oil Company.

From the VI-A *News* we learn that Roger Bross '39 is working for the Universal Winding Company in Cranston, R.I. In working hours he experiments on a precision winder with a constant-speed yarn, his biggest obstacle being the application of ounce-inch torques to a one-twentieth horsepower motor. In his spare time he's playing around with amateur radio, as well as taking charge of a basketball league and a woodworking class at the Y.M.C.A. — We were interested to learn recently that the New York and Bermudian Air Line had appointed Alfred Wagner, XV-B, as industrial engineer. He's now spending a great deal of time in Washington, but will undoubtedly be stationed in Bermuda in the very near future. — Which reminds us that another air-minded classmate, Jim Thomson, IX-B, is now in France as a representative of United Aircraft, having recently gone over by ship and by way of Naples.

Ira Lohman, VI, was in Boston over April 19, and reported that he's still working for Jackson and Moreland, and is currently evaluating public utility properties in Allentown, Pa. Jim Gilliss, XIII, the most recent tycoon of the Federal Shipbuilding and Dry Dock Company, was also in Boston and reported that Louie Bradford had departed recently for warmer climes and a job in a Texas shipyard. — Jim says Archie Main is still at Gibbs and Cox and in the midst of designing an army transport when he isn't roaring around New York in his Packard (vintage, 1930). Nice going, Archie! — Another XIII man, John Haponik, was recently reported to be going great guns in the engineering department of the Fore River yard and taking his whack at trial trips whenever a ship goes to Rockland to go through her paces. — Fred Boland, VII, has a job that would appeal to a lot of the S.P.C.D.N.A. men. He's working for the Felton rum company, which makes Pilgrim rum, right in Boston!

Well, that's more news than we thought we would find for this month's issue, but with your Secretary settled in Mount Vernon for three weeks out of four, and with the Assistant Secretary turning over a new leaf, we promise that we'll make life unbearable for some of our Course Secretaries and informers until they come across with the right sort of information for these pages. — Incidentally, those of you who can, come to Alumni Day next Monday, June 3. — DALE F. MORGAN, *General Secretary*, 55 Pennsylvania Avenue, Mount Vernon, N.Y. LLOYD BERGESON, *Assistant Secretary*, 885 Beacon Street, Newton Centre, Mass.

## 1939

A letter from Ray Barbera, II, contains the following news: "Something about what I am doing? Yes — but first a word about several others: The Review



1939 Continued

mentioned Carl Swanson's marriage. May I add that the happy mate was, I am quite certain, his old gal and sparring partner, Phil Dupar, a fine girl. Earl Larson is doing very well with the B. F. Goodrich Company in Akron, in the same laboratory in which I expend my efforts. Also, incidentally, he is doing good work for his newly acquired boss — the former Anne Haakonsen. A good cigar was enjoyed by yours truly, but the wedding did me out of a traveling companion. You see, Earl and I were wont to throw our toothbrushes, razors, and extra shirts into the back of his car, and dash madly over the 700-odd miles to Boston for a week end. Now I must travel alone — ah, me — but not for too long I hope.

"Riley Anthony is with the Goodyear flying squadron at Jackson, Mich., learning all about rubber from the ground down. If present plans materialize, he will be in Akron soon, and we will join forces. At last reports, Alphonse Graffeo was entering the graduate Course in Naval Architecture at the Institute. Met Vahey Kupelian in town a couple of days ago — him heep beeg cheese at Wright Motors in Connecticut.

"My own work is that of a testing engineer in the B. F. Goodrich physical testing laboratories in Akron — a sooty, dreary, never-blessed-by-sunlight city of about 250,000, somewhere in Ohio between the Ohio River and Lake Erie. My job is concerned with the control, research, and development testing of any one of the 32,000 products which the aforesaid company manufactures. Some of these are tires, all types of belting, airplane hose, deicers, and gadgets, fire hose, garden hose, hose, rubber sundries of all sorts — oh, thousands of things. The testing equipment is of all types — some familiar and simple, some strange and complicated. We play with high-pressure steam, high velocities, and electrical resistances and voltages, and in short have a good time making as if we knew what we were doing."

A card from Nic Ferreira bears the following: "Geographically, I am the

only member of the Class in this part of the globe as far as I know. No news about classmates. As for myself I am glad to mention that I am employed by I.S.C.O.R. (Iron and Steel Corporation), Pretoria, South Africa. Crossed the Atlantic during the first month of the present European conflict. The year greeted me as an engaged man; fiancée: Miss Salome van Zyl, Steynsrust, Orange Free State."

We hear that Harold Snow, V, married a home-town (Pine Point, Maine) girl, Marjorie Douglass, sometime during the winter. The couple is now living in Kenmore, N.Y. By the time this reaches print, Stue Stearns, V, will be the husband of the former Miss Phyllis Robb of Upper Montclair, N.J. As we continue along this emotional trend, we note the recent marriage of Byron Hunicke, II, to Miss Priscilla Washburn of Plainville, Mass., on April 6. Tom Akin, IV, was married in the fall to Miss Helen Weaver of Englewood, N.J. — our apologies for tardiness in reporting.

Ryder Pratt, XV, has become engaged to Miss Elizabeth Scott of Oak Park, Ill., and Bob Pratt, II-A, to Miss Parmys Goodale of South Weymouth, Mass. From Course III: Robert Pancake is to be congratulated on his engagement to Miss Edwina Handsfield of Garden City, L.I. Bob has been working for the North Whitney Mines, Ltd., Pamour, Ontario. The engagement of Meredith Wardle, XVI (again a late report), and Miss Letita Stimson of the Coconut Grove Colony, Fla., has been announced, as has the engagement of Richard Feynman, VIII, to Miss Arline Greenbaum of Cedarhurst, L.I. Dick is spending the rest of his time as a research assistant at Princeton.

A letter from Pete Bernays, V, reads: "Bob Saks, XVI, is at Consolidated Aircraft at San Diego; Myron Cantor, IX-B, is working for an aircraft company in Buffalo; and Leonard Mautner, VI, is working for the Macbeth Daylighting Corporation in New York. Also, Maurice Meyer of the Course VI honors group recently got a job with the Columbia

Broadcasting System in the sound-effects department, doing development work. — M.I.T. seems rather quiet, although I had a long letter from Ernie Kaswell, IX-A, who is now an assistant in the Mechanical Engineering Department, working for an M.S. in textile technology. Joe Zallen, V, writes: 'I am a full-fledged graduate student in biology at Harvard. More concisely, I'm studying plant physiology; my studies are very botanical, but the chemistry of plants is my real object, and these courses are giving me a wide biological background.' "

From Bob Saunders, XV, working for the Mohawk Carpet Mills in Amsterdam, N.Y., we hear: "The work here at Mohawk is coming along very well; I haven't been made vice-president yet, but am through with the training period now. At present I'm doing some quality-control work which involves establishing a new system for the whole plant, so I manage to keep rather busy, to say the least."

And from Paul Stamatos, II: "Do you remember that junior prom? Or do you? Regardless, the young lady I escorted is the lucky little woman to be. So you see, I'm all set: a fine job, a fine gal — all I have to do is get a higher salary and I'll have the makings of a fine home. Bob Stone, II, is with Formica Insulation of Cincinnati and seems to be enjoying it. Bus Emerson, XV, is still training with I.B.M. and likewise on the verge of getting married." — Paul himself is working for Sears, Roebuck and Company in their training course, studying merchandising and retailing in a big way.

And, finally a report has come that Frank Leonard, XIX, has returned to his home town of McGill, Nev., and re-entered the employ of the Nevada Consolidated Copper Corporation. At present he acts in a secretarial capacity to Mr. Larson, the smelter superintendent. He was formerly in the assay laboratory. — STUART PAIGE, *General Secretary*, Box 207, Greenwich, Conn. MORRIS E. NICHOLSON, *Assistant Secretary*, M.I.T. Graduate House, Cambridge, Mass.

# COME BACK TO TECH

for

# ALUMNI DAY

## JUNE 3, 1940

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# YOU GET A TWELVE-FOLD SAVING from



**1** Ruptures in outside ply eliminated—because it is under the *same tension* as inside plies—therefore no “broken backs” to shorten belt service.

**2** Freedom from ply separation—because plies under equal tension cling together and work as a team, each strengthening the others and therefore

**3** Longer fastener life—because strain is uniform.

**4** Can be operated on smaller pulleys—because plies are compensated for even tension and belt flexes naturally and easily without strain.

**5** Less bearing, shafting and hanger troubles—because Condor Compensated with special low-tension surface,\* can be run slack and still grip the pulley throughout the arc of contact.

**6** For heavy loads, plies may be increased with same pulleys—because ply stresses, where belt flexes around the pulley, are borne equally by all plies.

**7** Operation less affected by atmospheric conditions—because construction permits running belt at low tension.

**8** Higher overload capacity or margin of safety—because of high coefficient of friction surface on pulley side, which keeps the belt gripping the pulley.

**9** Less wear on pulley side—because belt may be operated at lower tension without increase in slip or creep and without “chatter.”

**10** Can be dressed without injury to belt—an important feature.

**11** High production efficiency—because operation is uninterrupted by need for frequent “take-ups,” pulled or broken fasteners or premature belt failure.

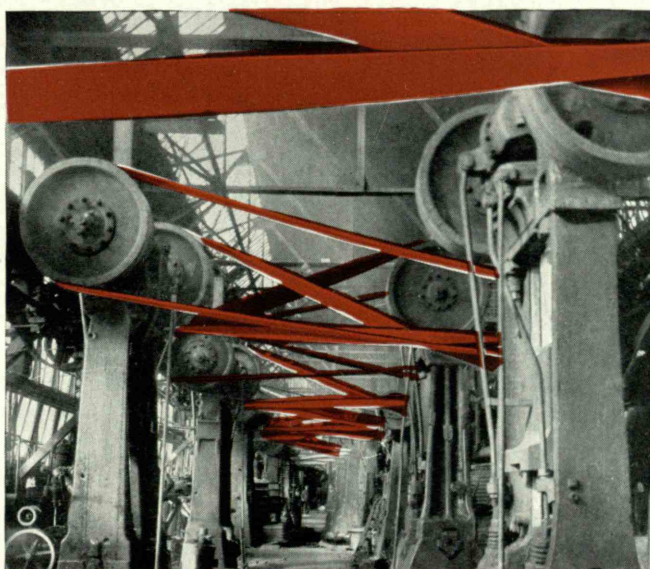
**12** Material reduction in belting costs—because Condor Compensated lasts so long that it outearns its cost.

\* Also available in Type F where rubber friction pulley surface is desired, and Type B where some slip is necessary.

If you want the details in picture and words, write for Bulletin 6808-C

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# 25 YEARS AGO

1915

JUNE

1915

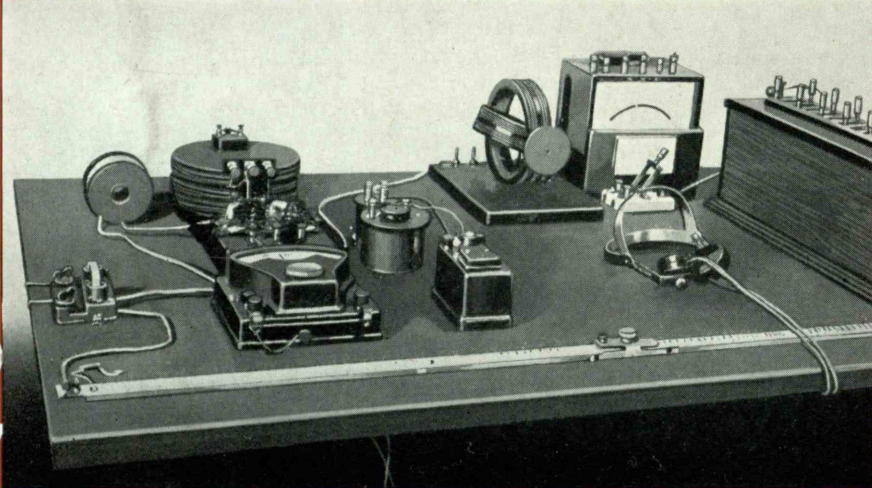
Sun

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Sat

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1915

SKIN-EFFECT RESISTANCE MEASUREMENTS OF CONDUCTORS at radio frequencies up to 100,000 cycles per second. During 1915-1916 important research on this problem was undertaken at one of the leading educational institutions with the equipment shown — the latest then available. Included in the set-up are an Alexanderson r-f alternator delivering 2 kw at 100,000 cycles, a hot-wire ammeter, adjustable paper condenser, variable air condenser, fixed telephone condenser, single slide-wire, fixed and adjustable inductances, a portable galvanometer, a headset and 1,000-cycle commutator interruptor. These instruments represented the latest developments in the instrumentation field in 1915.

1940

TWENTY-FIVE YEARS LATER the same measurements can be duplicated with this equipment at frequencies up to 1,000,000 cycles per second and with accuracies far in excess of those possible in 1915. Included are General Radio Type 516-C Radio Frequency Bridge, Type 684-A Modulated Oscillator, Type 619-E Heterodyne Detector, Type 663 Resistors and a headset. Before 1940 has gone by G-R instruments will probably be available to extend the frequency range of these measurements to 10,000,000 cycles!

1940

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**G**ENERAL RADIO COMPANY celebrates its 25th Anniversary this month. The twenty-fifth year in the life of most companies or persons is not particularly significant; but in the radio and electronic measuring-apparatus field twenty-five years takes one practically back to the beginning. General Radio is probably the oldest company of its kind in the world. It has been continuously engaged (under the same name, with the same directing head and

with the same managerial policy) in the design, manufacture and sale of precision electrical laboratory apparatus for use at communication frequencies. General Radio instruments have always kept abreast of the developments in the electronic art and its apparatus has in no small measure contributed to the ease with which further developments have been and are possible.

The extent of diversification in the manufacture of its apparatus is always

surprising to persons not long familiar with General Radio. G-R instruments are in use throughout the entire world in the leading laboratories, factories and commercial organizations.

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